

HP ProLiant BL p-Class GbE2 Interconnect Switch Command Reference Guide



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Contents

About This Guide

Technician Notes	vii
Where to Go for Additional Help	viii
Telephone Numbers	viii

Chapter 1

The Command Line Interface

Introduction	1-1
Additional References	1-2
Connecting to the GbE2 Interconnect Switch	1-2
Establishing a Console Connection	1-2
Setting an IP Address	1-3
Establishing a Telnet Connection	1-3
Establishing an SSH Connection	1-4
Accessing the GbE2 Interconnect Switch	1-5
Idle Timeout	1-7
Typographical Conventions	1-7

Chapter 2

Menu Basics

Introduction	2-1
The Main Menu	2-1
Menu Summary	2-2
Global Commands	2-3
Command Line History and Editing	2-5
Command Line Interface Shortcuts	2-6
Command Stacking	2-6
Command Abbreviation	2-6
Tab Completion	2-6

Chapter 3

First-Time Configuration

Introduction	3-1
Using the Setup Utility	3-1
Information Needed For Setup	3-1
Starting Setup When You Log In	3-2
Stopping and Restarting Setup Manually	3-3
Setup Part 1: Basic System Configuration	3-3
Setup Part 2: Port Configuration	3-5

Setup Part 3: VLANs	3-6
Setup Part 4: Internet Protocol Configuration	3-8
Setup Part 5: Final Steps	3-10
Optional Setup for Simple Network Management Protocol Support	3-10
Setting Passwords	3-11
Changing the Default Administrator Password	3-11
Changing the Default User Password	3-13
Changing the Default Operator Password	3-14

Chapter 4

The Information Menu

Introduction	4-1
Information Menu	4-1
ARP Information	4-5
Show All ARP Entry Information	4-6
ARP Address List Information	4-6
FDB Information Menu	4-7
Show All FDB Information	4-8
System Information	4-9
Show Last 30 Syslog Messages	4-10
Link Status Information	4-11
Spanning Tree Information	4-12
VLAN Information	4-14
Port Information	4-15
IP Information	4-16
Trunk Group Information	4-16
Clear Syslog Messages	4-16
Information Dump	4-17

Chapter 5

The Statistics Menu

Introduction	5-1
Statistics Menu	5-1
Port Statistics Menu	5-2
Bridging Statistics	5-3
Ethernet Statistics	5-5
Interface Statistics	5-9
Link Statistics	5-11
Management Processor Statistics	5-11
MP Packet Statistics	5-12
TCP Statistics	5-13
UCB Statistics	5-13
MP-specific SFD Statistics	5-14
CPU Statistics	5-14
Interface Statistics	5-15
IP Statistics	5-17
ICMP Statistics	5-18
TCP Statistics	5-20
UDP Statistics	5-21
SNMP Statistics	5-22

FDB Statistics	5-25
ARP statistics	5-25
DNS Statistics	5-26
Statistics Dump	5-26

Chapter 6

The Configuration Menu

Introduction	6-1
Configuration Menu	6-1
Viewing, Applying, Reverting, and Saving Changes	6-2
Viewing Pending Changes	6-2
Applying Pending Changes	6-3
Reverting Changes	6-3
Saving the Configuration.....	6-3
System Configuration.....	6-4
System Host Log Configuration	6-6
Secure Shell Server Configuration.....	6-7
RADIUS Server Configuration.....	6-9
NTP Server Configuration	6-10
User Access Control Configuration	6-11
Port Configuration.....	6-12
Port Link Configuration.....	6-13
Temporarily Disabling a Port.....	6-14
IP Configuration	6-14
IP Interface Configuration	6-15
Default IP Gateway Configuration	6-16
Domain Name System Configuration.....	6-17
VLAN Configuration	6-18
Spanning Tree Configuration	6-19
Bridge Spanning Tree Configuration.....	6-20
Spanning Tree Port Configuration	6-21
SNMP Configuration.....	6-22
Port Mirroring.....	6-24
Port-Based Port Mirroring	6-25
Trunk Configuration.....	6-26
Setup.....	6-27
Dump.....	6-27
Saving the Active GbE2 Interconnect Switch Configuration.....	6-27
Restoring the Active GbE2 Interconnect Switch Configuration	6-28

Chapter 7

The Operations Menu

Introduction	7-1
Operations Menu	7-1
Operations-Level Port Options	7-2

Chapter 8

The Boot Options Menu

Introduction	8-1
Boot Menu.....	8-1

Updating the GbE2 Interconnect Switch Software Image	8-2
Downloading New Software to Your GbE2 Interconnect Switch.....	8-2
Selecting a Software Image to Run.....	8-3
Uploading a Software Image from Your GbE2 Interconnect Switch	8-4
Selecting a Configuration Block	8-5
Resetting the GbE2 Interconnect Switch	8-5

Chapter 9

The Maintenance Menu

Introduction.....	9-1
Maintenance Menu.....	9-1
System Maintenance Options	9-2
Forwarding Database Options	9-3
Debugging Options.....	9-4
ARP Cache Options.....	9-5
Uuencode Flash Dump	9-6
TFTP System Dump Put.....	9-6
Clearing Dump Information	9-7
Panic Command	9-7
Unscheduled System Dumps	9-8

Index

About This Guide

This guide can be used for reference when configuring and maintaining the HP ProLiant BL p-Class GbE2 Interconnect Switch.



WARNING: To reduce the risk of personal injury from electric shock and hazardous energy levels, only authorized service technicians should attempt to repair this equipment. Improper repairs can create conditions that are hazardous.

Technician Notes



WARNING: Only authorized technicians trained by HP should attempt to repair this equipment. All troubleshooting and repair procedures are detailed to allow only subassembly/module-level repair. Because of the complexity of the individual boards and subassemblies, no one should attempt to make repairs at the component level or to make modifications to any printed wiring board. Improper repairs can create a safety hazard.



WARNING: To reduce the risk of personal injury from electric shock and hazardous energy levels, do not exceed the level of repairs specified in these procedures. Because of the complexity of the individual boards and subassemblies, do not attempt to make repairs at the component level or to make modifications to any printed wiring board. Improper repairs can create conditions that are hazardous.



WARNING: To reduce the risk of electric shock or damage to the equipment:

- Disconnect power from the system by unplugging all power cords from the power supplies.
 - Do not disable the power cord grounding plug. The grounding plug is an important safety feature.
 - Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.
-



CAUTION: To properly ventilate the system, you must provide at least 7.6 cm (3.0 in.) of clearance at the front and back of the switch.



CAUTION: The computer is designed to be electrically grounded (earthed). To ensure proper operation, plug the AC power cord into a properly grounded AC outlet only.

NOTE: Any indications of component replacement or printed wiring board modifications may void any warranty.

Where to Go for Additional Help

In addition to this guide, the following information sources are available:

- *HP ProLiant BL p-Class GbE2 Interconnect Switch Application Guide*
- *HP ProLiant BL p-Class GbE2 Interconnect Switch User Guide*
- *HP ProLiant BL p-Class GbE2 Interconnect Switch Browser-based Interface Reference Guide*
- *HP ProLiant BL p-Class C-GbE2 Interconnect Kit Quick Setup Instructions*
- *HP ProLiant BL p-Class F-GbE2 Interconnect Kit Quick Setup Instructions*
- Service training guides
- Service advisories and bulletins
- QuickFind information services
- Insight Manager software

Telephone Numbers

For the name of your nearest HP authorized reseller:

- In the United States, call 1-800-345-1518.
- In Canada, call 1-800-263-5868.

For HP technical support:

- In the United States and Canada, call 1-800-652-6672.
- Outside the United States and Canada, refer to
www.hp.com

The Command Line Interface

Introduction

Your HP ProLiant BL p-Class GbE2 Interconnect Switch is ready to perform basic switching functions right out of the box. Some of the more advanced features, however, require some administrative configuration before they can be used effectively.

The extensive switching software included in your GbE2 Interconnect Switch provides a variety of options for accessing and configuring the GbE2 Interconnect Switch:

- A built-in, text-based command line interface (CLI) and menu system for access via a local terminal or remote Telnet/Secure Shell (SSH) session
- Simple Network Management Protocol (SNMP) support for access through network management software such as HP OpenView and HP Insight Manager 7
- A browser-based management interface for interactive network access through your Web browser

The command line interface is the most direct method for collecting GbE2 Interconnect Switch information and performing switch configuration. Using a basic terminal, you are presented with a hierarchy of menus that enable you to view information and statistics about the GbE2 Interconnect Switch, and to perform any necessary configuration.

This chapter explains how to access the CLI to the GbE2 Interconnect Switch.

Additional References

Additional information about installing and configuring the GbE2 Interconnect Switch is available in the following guides, which are located on the ProLiant BL p-Class GbE2 Interconnect Switch Management Utilities and User Documentation CD:

- *HP ProLiant BL p-Class GbE2 Interconnect Switch User Guide*
- *HP ProLiant BL p-Class GbE2 Interconnect Switch Application Guide*
- *HP ProLiant BL p-Class GbE2 Interconnect Switch Browser-based Interface Reference Guide*

Connecting to the GbE2 Interconnect Switch

You can access the command line interface in one of the following ways:

- Using a console connection via the console port
- Using a Telnet connection over the network
- Using a Secure Shell (SSH) connection to securely log in over a network

Establishing a Console Connection

To establish a console connection with the GbE2 Interconnect Switch, you need:

- A null modem cable with a female DB-9 connector (Refer to the *HP ProLiant BL p-Class GbE2 Interconnect Switch User Guide* for more information.)
- An ASCII terminal or a computer running terminal emulation software set to the parameters shown in the table below

Table 1-1: Console Configuration Parameters

Parameter	Value
Baud Rate	9600
Data Bits	8
Parity	None
Stop Bits	1
Flow Control	None

To establish a console connection with the GbE2 Interconnect Switch:

1. Connect the terminal to the console port using the null modem cable.
2. Power on the terminal.
3. Press the **Enter** key a few times on your terminal to establish the connection.
4. You will be required to enter a password for access to the GbE2 Interconnect Switch. (For more information, refer to the “Setting Passwords” section in Chapter 3.)

Setting an IP Address

To access the GbE2 Interconnect Switch via a Telnet or an SSH connection, you need to have an Internet Protocol (IP) address set for the switch. The GbE2 Interconnect Switch can get its IP address in one of two ways:

- Using a Bootstrap Protocol (BOOTP) server—By default, the management interface is set up to request its IP address from a BOOTP server. If you have a BOOTP server on your network, add the Media Access Control (MAC) address of the GbE2 Interconnect Switch to the BOOTP configuration file located on the BOOTP server. The MAC address can be found on a small white label on the back panel of the GbE2 Interconnect Switch. The MAC address can also be found in the System Information menu (Refer to the “System Information” section in Chapter 4.) If you are using a DHCP server that also does BOOTP, you do not have to configure the MAC address.
- Configuring manually—If your network does not support BOOTP, you must configure the management port with an IP address. For information on how to manually configure the IP address, refer to the “Setup Part 1: Basic System Configuration” section in Chapter 3.

Establishing a Telnet Connection

A Telnet connection offers the convenience of accessing the GbE2 Interconnect Switch from any workstation connected to the network. Telnet provides the same options for user, operator, and administrator access as those available through the console port. By default, Telnet is enabled on the GbE2 Interconnect Switch. The GbE2 Interconnect Switch supports four concurrent Telnet connections.

Once the IP parameters are configured, you can access the CLI using a Telnet connection. To establish a Telnet connection with the GbE2 Interconnect Switch, run the Telnet program on your workstation and enter the **telnet** command, followed by the GbE2 Interconnect Switch IP address:

```
telnet <GbE2 Interconnect Switch IP address>
```

You will then be prompted to enter a password. The password entered determines the access level: administrator, operator, or user. Refer to the “Accessing the GbE2 Interconnect Switch” section later in this chapter for description of default passwords.

Establishing an SSH Connection

Although a remote network administrator can manage the configuration of a GbE2 Interconnect Switch via Telnet, this method does not provide a secure connection. The Secure Shell (SSH) protocol enables you to securely log into the GbE2 Interconnect Switch over the network.

As a secure alternative to using Telnet to manage GbE2 Interconnect Switch configuration, SSH ensures that all data sent over the network is encrypted and secure. In order to use SSH, you must first configure it on the GbE2 Interconnect Switch. Refer to the “Secure Shell Server Configuration” section in Chapter 6, for information on how to configure SSH.

The GbE2 Interconnect Switch can perform only one session of key/cipher generation at a time. Therefore, an SSH/Secure Copy (SCP) client will not be able to log in if the GbE2 Interconnect Switch is performing key generation at that time or if another client has just logged in before this client. Similarly, the system will fail to perform the key generation if an SSH/SCP client is logging in at that time.

The supported SSH encryption and authentication methods are listed below.

- Server Host Authentication—Client RSA authenticates the GbE2 Interconnect Switch in the beginning of every connection
- Key Exchange—RSA
- Encryption—3DES-CBC, Data Encryption Standard (DES)
- User Authentication—Local password authentication; Remote Authentication Dial-in User Service (RADIUS)

The following SSH clients are supported:

- SSH 1.2.23 and SSH 1.2.27 for Linux (freeware)
- SecureCRT® 3.0.2 and SecureCRT 3.0.3 (VanDyke Technologies, Inc.)
- F-Secure® SSH 1.1 for Windows® (F-Secure Corporation)
- OpenSSH_3.4 for Linux (RH 8.1)
- PuTTY Release 0.51 (Simon Tatham) for Windows

NOTE: The GbE2 Interconnect Switch implementation of SSH is based on version 1.5, and supports SSH clients from version 1.0 through version 1.5. SSH clients of other versions (especially Version 2) are not supported.

By default, SSH service is enabled on the GbE2 Interconnect Switch. Once the IP parameters are configured, you can access the command line interface using an SSH connection.

To establish an SSH connection with the GbE2 Interconnect Switch, run the SSH program on your workstation by issuing the **ssh** command, followed by the GbE2 Interconnect Switch IP address:

```
>> # ssh <GbE2 Interconnect Switch IP address>
```

You will then be prompted to enter your password.

NOTE: The first time you run SSH from your workstation, a warning message may display. At the prompt, enter **yes** to continue.

Accessing the GbE2 Interconnect Switch

To enable better switch management and user accountability, the GbE2 Interconnect Switch provides different levels or classes of user access. Levels of access to the CLI and Web management functions and screens increase as needed to perform various GbE2 Interconnect Switch management tasks. The three levels of access are:

- **User**—User interaction with the GbE2 Interconnect Switch is completely passive; nothing can be changed on the GbE2 Interconnect Switch. Users may display information that has no security or privacy implications, such as GbE2 Interconnect Switch statistics and current operational state information.
- **Operator**—Operators can only effect temporary changes on the GbE2 Interconnect Switch. These changes will be lost when the GbE2 Interconnect Switch is rebooted/reset. Operators have access to the GbE2 Interconnect Switch management features used for daily GbE2 Interconnect Switch operations. Because any changes an operator makes are undone by a reset of the GbE2 Interconnect Switch, operators cannot severely impact GbE2 Interconnect Switch operation.
- **Administrator**—Only administrators can make permanent changes to the GbE2 Interconnect Switch configuration, changes that are persistent across a reboot/reset of the GbE2 Interconnect Switch. Administrators can access GbE2 Interconnect Switch functions to configure and troubleshoot problems on the switch. Because administrators can also make temporary (operator-level) changes as well, they must be aware of the interactions between temporary and permanent changes.

Access to GbE2 Interconnect Switch functions is controlled through the use of unique usernames and passwords. Once you are connected to the GbE2 Interconnect Switch via the local console, Telnet, or SSH, you are prompted to enter a password. The password entered determines the access level. The default user names/password for each access level are listed in the following table.

NOTE: It is recommended that you change default GbE2 Interconnect Switch passwords after initial configuration and as regularly as required under your network security policies. For more information, refer to the “Setting Passwords” section in Chapter 3.

Table 1-2: User Access Levels

User Account	Description and Tasks Performed	Password
User	The user has no direct responsibility for GbE2 Interconnect Switch management. He or she can view all GbE2 Interconnect Switch status information and statistics, but cannot make any configuration changes to the GbE2 Interconnect Switch.	user
Operator	The operator manages all functions of the GbE2 Interconnect Switch. The operator can reset ports or the entire GbE2 Interconnect Switch. By default, the operator account is disabled and has no password.	
Administrator	The super user administrator has complete access to all menus, information, and configuration commands on the GbE2 Interconnect Switch, including the ability to change both the user and administrator passwords.	admin

NOTE: With the exception of the “admin” user, setting the password to an empty value can disable access to each user level. By default, **user** and **admin** are enabled.

Once you enter the administrator password and it is verified, the **Main Menu** of the CLI is displayed with administrator privileges. Refer to Chapter 2 for a summary of the Main Menu options.

```
[Main Menu]
info      - Information Menu
stats     - Statistics Menu
cfg       - Configuration Menu
oper      - Operations Command Menu
boot      - Boot Options Menu
maint     - Maintenance Menu
diff      - Show pending config changes [global command]
apply     - Apply pending config changes [global command]
save      - Save updated config to FLASH [global command]
revert    - Revert pending or applied changes [global command]
exit      - Exit [global command, always available]

>> Main#
```

Idle Timeout

By default, the GbE2 Interconnect Switch will disconnect your console, Telnet, or SSH session after five minutes of inactivity. This function is controlled by the idle timeout parameter, which can be set from 1 to 60 minutes. For information on changing this parameter, refer to the “System Configuration” section in Chapter 6.

Typographical Conventions

The following table describes the typographic styles used in this guide:

Table 1-3: Typographic Conventions

Typeface or Symbol	Meaning	Example
AaBbCc123	This type depicts onscreen computer output and prompts.	Main#
AaBbCc123	This type displays in command examples and shows text that must be typed in exactly as shown.	Main# sys
<i><AaBbCc123></i>	This italicized type displays in command examples as a parameter placeholder. Replace the indicated text with the appropriate real name or value when using the command. Do not type the brackets. This also shows guide titles, special terms, or words to be emphasized.	To establish a Telnet session, enter: host# telnet <i><IP address></i> Read your <i>User's Guide</i> thoroughly.
[]	Command items shown inside brackets are optional and can be used or excluded as the situation demands. Do not type the brackets.	host# ls [-a]

Menu Basics

Introduction

The HP ProLiant BL p-Class GbE2 Interconnect Switch CLI is used for viewing switch information and statistics. In addition, the administrator can use the CLI for performing all levels of GbE2 Interconnect Switch configuration.

To make the CLI easy to use, the various commands have been logically grouped into a series of menus and submenus. Each menu displays a list of commands and/or submenus that are available, along with a summary of what each command will do. Below each menu is a prompt where you can enter any command appropriate to the current menu.

This chapter describes the **Main Menu** commands, and provides a list of commands and shortcuts that are commonly available from all the menus within the CLI.

The Main Menu

The **Main Menu** displays after a successful connection and login. The following table shows the **Main Menu** for the administrator login. Some features are not available under the user login.

[Main Menu]	
info	- Information Menu
stats	- Statistics Menu
cfg	- Configuration Menu
oper	- Operations Command Menu
boot	- Boot Options Menu
maint	- Maintenance Menu
diff	- Show pending config changes [global command]
apply	- Apply pending config changes [global command]
save	- Save updated config to FLASH [global command]
revert	- Revert pending or applied changes [global command]
exit	- Exit [global command, always available]

Menu Summary

The **Main Menu** displays the following submenus:

- **Information Menu**

The **Information Menu** provides submenus for displaying information about the current status of the GbE2 Interconnect Switch: from basic system settings to VLANs, and more. This menu is available from an administrator, user, and operator login.

- **Statistics Menu**

This menu provides submenus for displaying GbE2 Interconnect Switch performance statistics. This menu is available from an administrator, user, and operator login.

- **Configuration Menu**

This menu is available only from an administrator login. It includes submenus for configuring every aspect of the GbE2 Interconnect Switch. Changes to configuration are not active until explicitly applied. Changes can be saved to non-volatile memory (NVRAM).

- **Operations Command Menu**

Operations-level commands are used for making immediate and temporary changes to GbE2 Interconnect Switch configuration. This menu is used for bringing ports temporarily in and out of service. This menu is available only from an administrator and operator login.

- **Boot Options Menu**

The **Boot Options Menu** is available only from an administrator login. This menu is used for upgrading GbE2 Interconnect Switch software, selecting configuration blocks, and for resetting the GbE2 Interconnect Switch when necessary. This menu is also used to set the GbE2 Interconnect Switch back to factory settings.

- **Maintenance Menu**

This menu is used for debugging purposes, enabling you to generate a technical support dump of the critical state information in the GbE2 Interconnect Switch, and to clear entries in the Forwarding Database and the Address Resolution Protocol (ARP) and routing tables. This menu is available only from an administrator and operator login.

Global Commands

Some basic commands are recognized throughout the menu hierarchy. These commands are useful for obtaining online Help, navigating through menus, and for applying and saving configuration changes.

For help on a specific command, type **help**. The following screen displays:

Global Commands: [can be issued from any menu]			
help	up	print	pwd
lines	verbose	exit	quit
diff	apply	save	revert
ping	tracert	telnet	history
pushd	popd		
The following are used to navigate the menu structure:			
. Print current menu			
.. Move up one menu level			
/ Top menu if first, or command separator			
! Execute command from history			

The following table describes the global commands.

Table 2-1: Global Commands

Command	Action
? command or help	Provides usage information about a specific command on the current menu. When used without the command parameter, a summary of the global commands is displayed.
. or print	Displays the current menu.
.. or up	Moves up one level in the menu structure.
/	If placed at the beginning of a command, displays the Main Menu . Otherwise, this is used to separate multiple commands placed on the same line.
lines	Sets the number of lines (n) that display on the screen at one time. The default is 24 lines. When used without a value, the current setting is displayed.
diff	Shows any pending configuration changes that have not been applied. diff flash displays all pending configuration changes that have been applied but not saved to flash memory (NVRAM), as well as those that have not been applied.
apply	Applies pending configuration changes.
save	Saves the active configuration to backup, and saves the current configuration as active. save n saves the current configuration as active, without saving the active configuration to backup.
revert	Removes changes that have been made, but not applied. revert apply removes all changes that have not been saved.

continued

Table 2-1: Global Commands *continued*

Command	Action
exit or quit	Exits from the command line interface and logs out.
ping	<p>Verifies station-to-station connectivity across the network. The format is:</p> <p>ping <host name> <IP address> [(number of tries)> [msec delay]]</p> <ul style="list-style-type: none"> IP address is the hostname or IP address of the device. number of tries (optional) is the number of attempts (1-32). msec delay (optional) is the number of milliseconds between attempts.
tracert	<p>Identifies the route used for station-to-station connectivity across the network. The format is:</p> <p>tracert <host name> <IP address> [<max-hops> [msec delay]]</p> <ul style="list-style-type: none"> IP address is the hostname or IP address of the target station. max-hops (optional) is the maximum distance to trace (1-16 devices) msec delay (optional) is the number of milliseconds to wait for the response.
pwd	Displays the command path used to reach the current menu.
verbose n	<p>Sets the level of information displayed on the screen:</p> <ul style="list-style-type: none"> 0 = Quiet: Nothing displays except errors, not even prompts. 1 = Normal: Prompts and requested output are shown, but no menus. 2 = Verbose: Everything is shown. This is the default. When used without a value, the current setting is displayed.
telnet	<p>This command is used to Telnet out of the GbE2 Interconnect Switch. The format is:</p> <p>telnet <hostname> <IP address> [port]</p>
history	Displays the history of the last ten commands.
pushd	Remembers the current location in the directory of menu commands.
popd	Returns to the last pushd location.

Command Line History and Editing

Using the command line interface, you can retrieve and modify previously entered commands with just a few keystrokes. The following options are available globally at the command line:

Table 2-2: Command Line History and Editing Options

Option	Description
history	Displays a numbered list of the last ten previously entered commands.
!!	Repeats the last entered command.
!<i>n</i>	Repeats the <i>n</i> th command shown on the history list.
<Ctrl-p> or Up arrow key	Recalls the previous command from the history list. This can be used multiple times to work backward through the last ten commands. The recalled command can be entered as is, or edited using the options below.
<Ctrl-n> or Down arrow key	Recalls the next command from the history list. This can be used multiple times to work forward through the last ten commands. The recalled command can be entered as is, or edited using the options below.
<Ctrl-a>	Moves the cursor to the beginning of the command line.
<Ctrl-e>	Moves cursor to the end of the command line.
<Ctrl-b> or Left arrow key	Moves the cursor back one position to the left.
<Ctrl-f> or Right arrow key	Moves the cursor forward one position to the right.
<Backspace> or Delete key	Erases one character to the left of the cursor position.
<Ctrl-d>	Deletes one character at the cursor position.
<Ctrl-k>	Erases all characters from the cursor position to the end of the command line.
<Ctrl-l>	Redisplays the current line.
<Ctrl-u>	Clears the entire line.
Other keys	Inserts new characters at the cursor position.
.	Prints the current level menu list.
..	Moves to the previous directory level.

Command Line Interface Shortcuts

The following shortcuts allow you to enter commands quickly and easily.

Command Stacking

As a shortcut, you can type multiple commands on a single line, separated by forward slashes (/). You can connect as many commands as required to access the menu option that you want.

For example, the keyboard shortcut to access the **Simple Network Management Protocol (SNMP) Configuration Menu** from the **Main#** prompt is:

```
Main# cfg/snmp/name
```

Command Abbreviation

Most commands can be abbreviated by entering the first characters which distinguish the command from the others in the same menu or submenu.

For example, the command shown above could also be entered as:

```
Main# c/sn/n
```

Tab Completion

By entering the first letter of a command at any menu prompt and pressing the **Tab** key, the CLI will display all commands or options in that menu that begin with that letter. Entering additional letters will further refine the list of commands or options displayed.

If only one command fits the input text when the **Tab** key is pressed, that command will be supplied on the command line, waiting to be entered. If the **Tab** key is pressed without any input on the command line, the currently active menu displays.

First-Time Configuration

Introduction

To help with the initial process of configuring your GbE2 Interconnect Switch, the software includes a Setup utility. The Setup utility prompts you step-by-step to enter all the necessary information for basic configuration of the GbE2 Interconnect Switch. This chapter describes how to use the Setup utility and how to change system passwords.

Using the Setup Utility

The Setup utility can be activated manually from the command line interface any time after login.

You should run the Setup utility the first time you make a serial connection to the console port on the GbE2 Interconnect Switch. Refer to the “Establishing a Console Connection” section in Chapter 1.

Information Needed For Setup

Setup requests the following information:

- Basic system information
 - Date and time
 - Whether to use BOOTP or not
 - Whether to use Spanning Tree Protocol (STP) or not
- Optional configuration for each port
 - Speed, duplex, flow control, and negotiation mode (as appropriate)
 - Whether to use Virtual Local Area Network (VLAN) tagging or not (as appropriate)
- Optional configuration for each VLAN
 - Name of VLAN
 - Which ports are included in the VLAN

Starting Setup When You Log In

To start the Setup utility:

1. Connect to the GbE2 Interconnect Switch console. After connecting, the login prompt displays.

```
HP ProLiant BL p-Class F-GbE2 Interconnect Switch A
Copyright(C)2003 Hewlett-Packard Development Company, L.P.

Password:
```

2. Enter **admin** as the default administrator password.

The system displays the **Main Menu** with administrator privileges.

```
[Main Menu]
info      - Information Menu
stats     - Statistics Menu
cfg       - Configuration Menu
oper      - Operations Command Menu
boot      - Boot Options Menu
maint     - Maintenance Menu
diff      - Show pending config changes [global command]
apply     - Apply pending config changes [global command]
save      - Save updated config to FLASH [global command]
revert    - Revert pending or applied changes [global command]
exit      - Exit [global command, always available]

>> Main#
```

3. From the **Main Menu**, enter the following command to access the **Configuration Menu**:

```
Main# /cfg
```

The **Configuration Menu** is displayed.

```
[Configuration Menu]
sys       - System-wide Parameter Menu
port      - Port Menu
ip        - IP Menu
vlan      - VLAN Menu
stp       - Spanning Tree Menu
snmp      - SNMP Menu
pmirr     - Port Mirroring Menu
trunk     - Trunk Group Menu
setup     - Step by step configuration set up
dump      - Dump current configuration to script file
ptcfg    - Backup current configuration to tftp server
gtcfg    - Restore current configuration from tftp server
```

4. From the **Configuration Menu**, use the following command to access the Setup utility:

```
# setup
```

Stopping and Restarting Setup Manually

Use the following instructions to stop or restart the Setup utility manually.

Stopping Setup

To abort the Setup utility, press the **Ctrl-C** keys during any Setup question. When you abort Setup, the system will prompt:

```
Would you like to run from top again? [y/n]
```

Enter **n** to abort Setup, or **y** to restart the Setup program at the beginning.

Restarting Setup

You can restart the Setup utility manually at any time by entering the following command at the administrator prompt:

```
# /cfg/setup
```

Setup Part 1: Basic System Configuration

When Setup is started, the system prompts:

```
"Set Up" will walk you through the configuration of System Date and Time,
BOOTP, Spanning Tree, Port Speed/Mode, VLANs, and IP interfaces. [type
Ctrl-C to abort "Set Up"]

-----

Will you be configuring VLANs? [y/n]
```

1. Enter **y** if you will be configuring VLANs. Otherwise enter **n**.

If you decide not to configure VLANs during this session, you can configure them later using the configuration menus, or by restarting the Setup utility. For more information on configuring VLANs, refer to the *HP ProLiant BL p-Class GbE2 Interconnect Switch Application Guide*.

Next, the Setup utility prompts you to input basic system information.

2. Enter the year of the current date at the prompt:

```
Enter year [2003]:
```

Enter the year as a four-digit number. To keep the current year, press the **Enter** key.

3. Enter the month of the current system date at the prompt:

```
System Date:  
Enter month [1]:
```

Enter the month as a number from **1** to **12**. (For example: January = 1, February = 2, and so on) To keep the current month, press the **Enter** key.

4. Enter the day of the current date at the prompt:

```
Enter day [3]:
```

Enter the date as a number from **1** to **31**. To keep the current day, press the **Enter** key.

The system displays the date and time settings:

```
System clock set to 8:55:36 Wed Jan 3, 2003.
```

5. Enter the hour of the current system time at the prompt:

```
System Time:  
Enter hour in 24-hour format [18]:
```

Enter the hour as a number from **00** to **23**. To keep the current hour, press the **Enter** key.

6. Enter the minute of the current time at the prompt:

```
Enter minutes [55]:
```

Enter the minute as a number from **00** to **59**. To keep the current minute, press the **Enter** key.

7. Enter the seconds of the current time at the prompt:

```
Enter seconds [36]:
```

Enter the seconds as a number from **00** to **59**. To keep the current second, press the **Enter** key.

The system displays the date and time settings:

```
System clock set to 18:55:36 Wed Jan 3, 2003.
```

8. Enable or disable the use of BOOTP at the prompt:

```
BOOTP Option:
Current BOOTP:          enabled
Enter new BOOTP usage [d/e]:
```

If available on your network, a BOOTP server can supply the GbE2 Interconnect Switch with IP parameters so that you do not have to enter them manually. BOOTP must be disabled, however, before the system will prompt for IP parameters.

Enter **d** to disable the use of BOOTP, or enter **e** to enable the use of BOOTP. To keep the current setting, press the **Enter** key.

9. Turn Spanning Tree Protocol on or off at the prompt:

```
Spanning Tree:
Current Spanning Tree Group 1 setting: ON
Turn Spanning Tree Group 1 OFF? [y/n].
```

Enter **y** to turn off Spanning Tree Protocol, or enter **n** to leave Spanning Tree Protocol on.

Setup Part 2: Port Configuration

Next, you are prompted to configure the ports.

1. The system prompts you to enter the port number to configure, or press the **Enter** key to skip port configuration at the prompt:

```
Port Config:
Enter port number:
```

If you wish to change settings for individual ports, enter the number of the port you wish to configure. If you want to skip port configuration, press the **Enter** key without specifying any port and go to the “Setup Part 3: VLANs” section.

2. Configure Gigabit Ethernet port flow parameters.

The system prompts:

```
Gig Link Configuration:
Port Flow Control:
Current Port 1 flow control setting:    both
Enter new value ["rx"/"tx"/"both"/"none"]:
```

Enter **rx** to enable Receive Flow Control, **tx** for Transmit Flow Control, **both** to enable both, or **none** to turn Flow Control off for the port. To keep the current setting, press the **Enter** key.

3. Configure Gigabit Ethernet port auto-negotiation mode.

The system prompts:

```
Port Auto-negotiation:
Current Port 1 auto-negotiation:          on
Enter new value ["on"/"off"]:
```

Enter **on** or **off**. Press the **Enter** key to keep the current setting.

4. If configuring VLANs, enable or disable VLAN tagging for the port.

If you selected to configure VLANs in Part 1, the system prompts:

```
Port VLAN tagging config (tagged port can be a member of multiple
VLANs)
Current TAG flag:                      disabled
Enter new TAG status [d/e]:
```

Enter **d** to disable VLAN tagging for the port or enter **e** to enable VLAN tagging for the port. To keep the current setting, press the **Enter** key.

5. The system prompts you to configure the next port:

```
Enter port number:
```

When you are finished configuring ports, press the **Enter** key without specifying any port. Otherwise, repeat the steps in this section.

Setup Part 3: VLANs

If you selected to skip VLAN configuration in Part 1, skip to the “Setup Part 4: Internet Protocol Configuration” section.

1. Enter the number of the VLAN to configure, or press the **Enter** key to skip VLAN configuration at the prompt:

```
VLAN Config:
Enter VLAN number from 2 to 4095, NULL at end:
```

If you wish to change settings for individual VLANs, enter the number of the VLAN you wish to configure. “NULL at end” means to skip VLAN configuration, press the **Enter** key without typing a VLAN number. If you skip VLAN configuration, go to the “Setup Part 4: Internet Protocol Configuration” section.

2. Enter the new VLAN name at the prompt:

```
Current VLAN name:
Pending new VLAN name: VLAN 2
Enter new VLAN name:
```

Entering a new VLAN name is optional. To use the pending new VLAN name, press the **Enter** key.

3. Enter the VLAN port numbers.

The system prompts you to define the first port in the VLAN:

```
Define ports in VLAN:
Current VLAN 2: empty
Enter port numbers one per line, NULL at end:
```

Type the first port number to add to the current VLAN and press the **Enter** key. The following displays:

```
Port # is an UNTAGGED port and its current PVID is 1.
Confirm changing PVID from 1 to _. [y/n]
```

Type **y** or **n** to confirm your change. For each additional port in the VLAN, type the port number and press the **Enter** key to move to the next line. Repeat this until all ports for the VLAN being configured are entered. When you are finished adding ports to this VLAN, press the **Enter** key without specifying any port. A summary of all the ports you just entered displays.

4. The system prompts you to enter the new Spanning Tree Group index:

```
Spanning Tree Group membership:
Enter new Spanning Tree Group index [1-16]: 10
```

Enter a number from **1** to **16**.

5. The system prompts you to configure the next VLAN:

```
Enter VLAN number from 2 to 4095, NULL at end:
```

Repeat the steps in this section until all VLANs have been configured. When all VLANs have been configured, press the **Enter** key without specifying any VLAN.

Setup Part 4: Internet Protocol Configuration

If BOOTP was enabled in Part 1, skip to the “Setup Part 5: Final Steps” section. Otherwise, if you disabled BOOTP, the system prompts for IP parameters.

IP Interfaces

IP interfaces are used for defining subnets to which the GbE2 Interconnect Switch belongs. Up to 256 IP interfaces can be configured on the GbE2 Interconnect Switch. The IP address assigned to each IP interface provides the GbE2 Interconnect Switch with an IP presence on your network. No two IP interfaces can be on the same IP subnet. The interfaces can be used for connecting to the GbE2 Interconnect Switch for remote configuration, and for routing between subnets and VLANs (if used).

1. Set the IP interface to configure, or skip interface configuration at the prompt:

```
IP Config:
IP interfaces:
Enter interface number (1-256):
```

If you wish to configure individual IP interfaces, enter the number of the IP interface you wish to configure. If you want to skip IP interface configuration, press the **Enter** key without typing an interface number and go to the “Default Gateways” section.

2. For the specified IP interface, enter the IP address in dotted decimal notation:

```
Current IP address:      0.0.0.0
Enter new IP address:
```

To keep the current setting, press the **Enter** key.

3. At the prompt, enter the IP subnet mask in dotted decimal notation:

```
Current subnet mask:      0.0.0.0
Enter new subnet mask:
```

To keep the current setting, press the **Enter** key.

4. At the prompt, enter the broadcast IP address in dotted decimal notation:

```
Current broadcast address: 255.255.255.255
Enter new broadcast address:
```

To keep the current setting, press the **Enter** key.

5. If configuring VLANs, specify a VLAN for the interface.

The following prompt displays if you selected to configure VLANs in Part 1:

```
Current VLAN:      1
Enter new VLAN [1-4095]:
```

Enter the number for the VLAN to which the interface belongs, or press the **Enter** key without specifying a VLAN number to accept the current setting.

6. At the prompt, enter **y** to enable the IP interface, or **n** to leave it disabled:

```
Enable IP interface? [y/n]
```

7. The system prompts you to configure another interface:

```
Enter interface number:
```

Repeat the steps in this section until all IP interfaces have been configured. When all interfaces have been configured, press the **Enter** key without specifying any interface number.

Default Gateways

1. At the prompt, set the default gateway for configuration, or skip default gateway configuration:

```
IP default gateways:  
Enter default gateway number:  (1-2)
```

Enter the number for the default gateway to be configured. To skip default gateway configuration, press the **Enter** key without typing a gateway number.

2. At the prompt, enter the IP address for the selected default gateway:

```
Current IP address:      0.0.0.0  
Enter new IP address:
```

Enter the IP address in dotted decimal notation, or press the **Enter** key without specifying an address to accept the current setting.

3. At the prompt, enter **y** to enable the default gateway, or **n** to leave it disabled:

```
Enable default gateway? [y/n]
```

4. Repeat steps 1 through 3 if you want to configure the other gateway. If you do not want to configure the other gateway, press the **Enter** key without specifying the gateway number.

Setup Part 5: Final Steps

1. When prompted, decide whether to restart Setup or continue:

```
Would you like to run from top again? [y/n]
```

Enter **y** to restart the Setup utility from the beginning, or **n** to continue. If you select **y**, the Setup Utility restarts. The changes you made are shown as pending configuration which you can accept or update.

2. When prompted, decide whether you wish to review the configuration changes:

```
Review the changes made? [y/n]
```

Enter **y** to review the changes made during this session of the Setup utility. Enter **n** to continue without reviewing the changes. HP recommends that you review the changes.

3. Next, decide whether to apply the changes at the prompt:

```
Apply the changes? [y/n]
```

Enter **y** to apply the changes, or **n** to continue without applying. Changes are normally applied.

4. At the prompt, decide whether to make the changes permanent:

```
Save changes to flash? [y/n]
```

Enter **y** to save the changes to flash. Enter **n** to continue without saving the changes. Changes are normally saved at this point.

5. If you do not apply or save the changes, the system prompts whether to abort them:

```
Abort all changes? [y/n]
```

Enter **y** to discard the changes. Enter **n** to return to the **Apply the changes?** prompt.

NOTE: After initial configuration is complete, it is recommended that you change the default passwords as shown in the “Setting Passwords” section.

Optional Setup for Simple Network Management Protocol Support

NOTE: This step is optional. Perform this procedure only if you are planning on using Simple Network Management Protocol (SNMP)-based tools.

1. Use the following command to enable SNMP:

```
>> # /cfg/sys/snmp disable|read only|read/write
```

2. Set SNMP read or write community string. By default, they are public and private respectively:

```
>> # /cfg/snmp/rcomm|wcomm
```

3. When prompted, enter the proper community string.
4. Apply and save configuration if you are not configuring the GbE2 Interconnect Switch with Telnet support. Otherwise apply and save after the performing the “Optional Setup for Telnet Support” steps.

```
>> System# apply
>> System# save
```

Setting Passwords

HP recommends that you change all passwords after initial configuration and as regularly as required under your network security policies. Refer to the “Accessing the GbE2 Interconnect Switch” section in Chapter 1 for a description of the user access levels.

To change the user, operator, or administrator password, you must log in using the administrator password. Passwords cannot be modified from the user or operator command mode.

NOTE: If you forget your administrator password, call HP technical support for help using the password fix-up mode.

Changing the Default Administrator Password

The administrator has complete access to all menus, information, and configuration commands, including the ability to change both the user, operator, and administrator passwords.

The default password for the administrator account is **admin**. To change the default password:

1. Connect to the GbE2 Interconnect Switch and log in using the **admin** password.
2. From the **Main Menu**, use the following command to access the **Configuration Menu**:

```
Main# /cfg
```

The **Configuration Menu** is displayed.

```
[Configuration Menu]
  sys      - System-wide Parameter Menu
  port     - Port Menu
  ip       - IP Menu
  vlan     - VLAN Menu
  stp      - Spanning Tree Menu
  snmp     - SNMP Menu
  pmirr    - Port Mirroring Menu
  trunk    - Trunk Group Menu
  setup    - Step by step configuration set up
  dump     - Dump current configuration to script file
  ptcfg    - Backup current configuration to tftp server
  gtcfg    - Restore current configuration from tftp server
```


3. From the **Configuration Menu**, use the following command to select the **System Menu**:

```
>> Configuration# sys
```

The **System Menu** is displayed.

```
[System Menu]
  syslog - Syslog Menu
  sshd   - SSH Server Menu
  radius - RADIUS Authentication Menu
  ntp    - NTP Server Menu
  date   - Set system date
  time   - Set system time
  idle   - Set timeout for idle CLI sessions
  snmp   - Set SNMP access control
  wport  - Set Web server port number
  notice - Set login notice
  bannr  - Set login banner
  mnet   - Set management network
  mmask  - Set management netmask
  tnport - Set Telnet server port number
  hprompt - Enable/disable display hostname(sysName) in CLI prompt
  bootp  - Enable/disable use of BOOTP
  http   - Enable/disable HTTP (Web) access
  user   - User Access Control Menu (passwords)
  cur    - Display current system-wide parameters
```

4. Enter the following command to set the administrator password:

```
System# user/admpw
```

5. Enter the current administrator password at the prompt:

```
Changing ADMINISTRATOR password; validation required...
Enter current administrator password:
```

NOTE: If you forget your administrator password, call your technical support representative for help using the password fix-up mode.

6. Enter the new administrator password at the prompt:

```
Enter new administrator password:
```

7. Enter the new administrator password, again, at the prompt:

```
Re-enter new administrator password:
```

8. Apply and save your change by entering the following commands:

```
System# apply
System# save
```

Changing the Default User Password

The user login has limited control of the GbE2 Interconnect Switch. Through a user account, you can view GbE2 Interconnect Switch information and statistics, but you cannot make configuration changes.

The default password for the user account is **user**. This password cannot be changed from the user account. Only the administrator has the ability to change passwords, as shown in the following procedure.

1. Connect to the GbE2 Interconnect Switch and log in using the **admin** password.
2. From the **Main Menu**, use the following command to access the **Configuration Menu**:

```
Main# cfg
```

3. From the **Configuration Menu**, use the following command to select the **System Menu**:

```
>> Configuration# sys
```

4. Enter the following command to set the user password:

```
System# user/usrpw
```

5. Enter the current administrator password at the prompt.

Only the administrator can change the user password. Entering the administrator password confirms your authority.

```
Changing USER password; validation required...  
Enter current administrator password:
```

6. Enter the new user password at the prompt:

```
Enter new user password:
```

7. Enter the new user password, again, at the prompt:

```
Re-enter new user password:
```

8. Apply and save your changes:

```
System# apply  
System# save
```

Changing the Default Operator Password

The operator manages all functions of the GbE2 Interconnect Switch. The operator can reset ports or the entire GbE2 Interconnect Switch. Operators can only effect temporary changes on the GbE2 Interconnect Switch. These changes will be lost when the GbE2 Interconnect Switch is rebooted/reset. Operators have access to the GbE2 Interconnect Switch management features used for daily GbE2 Interconnect Switch operations. Because any changes an operator makes are undone by a reset of the GbE2 Interconnect Switch, operators cannot severely impact GbE2 Interconnect Switch operation.

By default, the operator account is disabled and has no password. This password cannot be changed from the operator account. Only the administrator has the ability to change passwords, as shown in the following procedure.

1. Connect to the GbE2 Interconnect Switch and log in using the **admin** password.
2. From the **Main Menu**, use the following command to access the **Configuration Menu**:

```
Main# cfg
```

3. From the **Configuration Menu**, use the following command to select the **System Menu**:

```
>> Configuration# sys
```

4. Enter the following command to set the operator password:

```
System# user/opw
```

5. Enter the current administrator password at the prompt.

Only the administrator can change the user password. Entering the administrator password confirms your authority.

```
Changing OPERATOR password; validation required...
Enter current administrator password:
```

6. Enter the new operator password at the prompt:

```
Enter new operator password:
```

7. Enter the new operator password, again, at the prompt:

```
Re-enter new operator password:
```

8. Apply and save your changes:

```
System# apply
System# save
```

The Information Menu

Introduction

You can view configuration information for the GbE2 Interconnect Switch in the user, operator, and administrator command modes. This chapter discusses how to use the CLI to display GbE2 Interconnect Switch information.

Information Menu

Command: **/info**

```
[Information Menu]
  arp      - ARP Information Menu
  fdb      - Forwarding Database Information Menu
  sys      - Show system information
  log      - Show last 30 syslog messages
  link     - Show link status
  stp      - Show STP information
  vlan     - Show VLAN information
  port     - Show port information
  ip       - Show IP information
  trunk    - Show Trunk Group information
  clrlog   - Clear syslog messages
  dump     - Dump all information
```

The following table describes the **Information Menu** options.

Table 4-1: Information Menu Options

Command	Usage
arp	Displays the Address Resolution Protocol (ARP) Information Menu .
fdb	Displays the Forwarding Database Information Menu .

continued

Table 4-1: Information Menu Options *continued*

Command	Usage
sys	Displays system information, including: <ul style="list-style-type: none">• System date and time• GbE2 Interconnect Switch model name and number• GbE2 Interconnect Switch name and location• GbE2 Interconnect Switch rack ID, chassis location, and slot occupied• Time of last boot• MAC address of the GbE2 Interconnect Switch management processor• IP address of IP interface #1• Hardware version and part number• Software image file and version number• Current configuration block• Log-in banner, if one is configured
log	Displays the 30 most recent syslog messages.
link	Displays configuration information about each port, including: <ul style="list-style-type: none">• Port number• Port speed (10 Mb/s, 100 Mb/s, 1000 Mb/s, or any)• Duplex mode (half, full, or any)• Flow control for transmit and receive (no, yes, or any)• Link status (up or down)

Table 4-1: Information Menu Options *continued*

Command	Usage
stp	<p>In addition to seeing if spanning tree protocol (STP) is enabled or disabled, you can view the following STP bridge information:</p> <ul style="list-style-type: none">• Current root MAC address• Path-cost• Port• Hello Interval• Maximum age value• Forwarding delay• Aging Time <p>You can also see the bridge parameters:</p> <ul style="list-style-type: none">• Priority• Hello interval• Maximum age value• Forwarding delay• Aging time <p>You can also see the following port-specific STP information:</p> <ul style="list-style-type: none">• Port number and priority• Cost• State• Designated bridge• Designated port

continued

Table 4-1: Information Menu Options *continued*

Command	Usage
vlan	Displays VLAN configuration information, including: <ul style="list-style-type: none">• VLAN number• VLAN name• Status• Port membership of the VLAN
port	Displays port status information, including: <ul style="list-style-type: none">• Port number• Whether the port uses VLAN tagging or not• Port VLAN ID (PVID)• Port name• VLAN membership
ip	Displays IP Information, including: <ul style="list-style-type: none">• IP interface information: Interface number, IP address, subnet mask, broadcast address, VLAN number, and operational status• Default gateway information: Interface number, gateway address, and operational status
trunk	When trunk groups are configured, you can view the state of each port in the various trunk groups.
clrlog	Clears syslog messages displayed with /info/log .
dump	Dumps all GbE2 Interconnect Switch information available from the Information Menu (10K or more, depending on your configuration). If you want to capture dump data to a file, set your communication software on your workstation to capture session data prior to issuing the dump commands.

ARP Information

Command: **/info/arp**

```
[Address Resolution Protocol Menu]
  find      - Show a single ARP entry by IP address
  port      - Show ARP entries on a single port
  vlan      - Show ARP entries on a single VLAN
  refpt     - Show ARP entries referenced by a single port
  dump      - Show all ARP entries
  addr      - Show ARP address list
```

The Address Resolution Protocol (ARP) information includes IP address and MAC address of each entry, address status flags, VLAN and port for the address, and port referencing information.

The following table describes the **Address Resolution Protocol Menu** options.

Table 4-2: ARP Information

Command	Usage
find <IP address (such as, 192.4.17.101)>	Displays a single ARP entry by IP address.
port <port number>	Displays the ARP entries on a single port.
vlan <VLAN number>	Displays the ARP entries on a single VLAN.
refpt <port number>	Displays the ARP entries referenced by a single port.
dump	Displays all ARP entries, including: <ul style="list-style-type: none"> • IP address and MAC address of each entry • Address status flag • The VLAN and port to which the address belongs • The ports which have referenced the address (empty if no port has routed traffic to the IP address shown)
addr	Displays the ARP address list: IP address, IP mask, MAC address, and VLAN flags.

Show All ARP Entry Information

Command: **/info/arp/dump**

IP address	Flags	MAC address	VLAN	Port	Referenced SPs
47.80.22.1		00:e0:16:7c:28:86	1	6	empty
47.80.23.243	P	00:03:42:fa:3b:30	1		1-4
47.80.23.245		00:c0:4f:60:3e:c1	1	6	empty
190.10.10.1	P	00:03:42:fa:3b:30	10		1-4

The **Referenced SPs** field displays switch ports that request ARP entry. Traffic that comes into the referenced ports has the destination IP address. From the ARP entry (the referenced ports), this traffic needs to be forwarded to the egress port (port 6 in the above example).

The **Flag** field provides additional information about an entry. If no flag displays, the entry is normal.

Table 4-3: ARP Dump Flag Parameters

Flag	Description
P	Permanent entry created for GbE2 Interconnect Switch IP interface.
R	Indirect route entry.
U	Unresolved ARP entry. The MAC address has not been learned.

ARP Address List Information

Command: **/info/arp/addr**

IP address	IP mask	MAC address	VLAN	Flags
205.178.18.66	255.255.255.255	00:70:cf:03:20:04		P
205.178.50.1	255.255.255.255	00:70:cf:03:20:06	1	
205.178.18.64	255.255.255.255	00:70:cf:03:20:05	1	

This screen displays all entries in the ARP cache.

FDB Information Menu

Command: **/info/fdb**

```
[Forwarding Database Menu]
find      - Show a single FDB entry by MAC address
port      - Show FDB entries on a single port
vlan      - Show FDB entries on a single VLAN
dump      - Show all FDB entries
```

The forwarding database (FDB) contains information that maps the media access control (MAC) address of each known device to the GbE2 Interconnect Switch port where the device address was learned. The FDB also shows which other ports have seen frames destined for a particular MAC address.

NOTE: The master forwarding database supports up to 2K MAC address entries on the management processor (MP) per GbE2 Interconnect Switch.

Table 4-4: FDB Information Menu /info/fdb

find <i><MAC address></i> [<i><VLAN></i>]	Displays a single database entry by its MAC address. You are prompted to enter the MAC address of the device. Enter the MAC address using the format: xx:xx:xx:xx:xx:xx . (For example: 08:00:20:12:34:56) You can also enter the MAC address using the format: xxxxxxxxxxxx . (For example: 080020123456)
port <i><port number></i>	Displays all FDB entries for a particular port.
vlan <i><VLAN number></i>	Displays all FDB entries on a single VLAN. The range is 1-4095.
dump	Displays all entries in the Forwarding Database.

Show All FDB Information

Command: **/info/fdb/dump**

MAC address	VLAN	Port	State
-----	----	----	-----
00:02:01:00:00:00	300	23	FWD
00:02:01:00:00:01	300	23	FWD
00:02:01:00:00:02	300	23	FWD
00:02:01:00:00:03	300	23	FWD
00:02:01:00:00:04	300	23	FWD
00:02:01:00:00:05	300	23	FWD
00:02:01:00:00:06	300	23	FWD
00:02:01:00:00:07	300	23	FWD
00:02:01:00:00:08	300	23	FWD
00:02:01:00:00:09	300	23	FWD
00:02:01:00:00:0a	300	23	FWD
00:02:01:00:00:0b	300	23	FWD
00:02:01:00:00:0c	300	23	FWD

An address that is in the forwarding (FWD) state, indicates that the GbE2 Interconnect Switch has learned it. When in the trunking (TRK) state, the port field represents the trunk group number. If the state for the port is listed as unknown (UNK), the MAC address has not yet been learned by the GbE2 Interconnect Switch, but has only been seen as a destination address. When an address is in the unknown state, no outbound port is indicated.

Clearing Entries from the Forwarding Database

To delete a MAC address from the forwarding database (FDB) or to clear the entire FDB, refer to the “Forwarding Database Options” section in Chapter 9.

System Information

Command: **/info/sys**

```
System Information at  9:31:52 Fri Apr  4, 2003

p-Class GbE2
sysName: 2JUnit1
sysLocation: Houston
RackId: 3334KJP3D030
RackName: BkRm3
Enclosure: D304JTK7D013
EnclosureName: Enterprise
Slot: A

Switch is up 1 day, 3 hours, 29 minutes and 0 seconds.
Last boot: 14:09:09 Thu Apr  3, 2003 (power cycle)

MAC address: 00:00:aa:aa:aa:26    IP (If 255) address: 134.177.215.161
Hardware Revision: 00
Hardware Part No: P314080-A
Software Version 2.0.0.5 (FLASH image1), active configuration.
```

System information includes:

- System date and time
- GbE2 Interconnect Switch model name and number
- GbE2 Interconnect Switch name and location
- Time of last boot
- MAC address of the GbE2 Interconnect Switch management processor
- IP address of IP interface #1
- Hardware version and part number
- Software image file and version number
- Current configuration block (active, backup, or factory default)
- Login banner, if one is configured

Show Last 30 Syslog Messages

Command: `/info/log`

Mar 31 14:27:55	NOTICE	mgmt: admin login from host 192.168.2.4
Mar 31 14:28:00	ERROR	cli: No apply needed
Mar 31 14:28:15	NOTICE	mgmt: admin logout from Telnet/SSH
Mar 31 14:28:27	NOTICE	mgmt: admin login from host 192.168.2.4
Mar 31 14:28:53	INFO	mgmt: new configuration saved
Mar 31 14:29:07	NOTICE	mgmt: admin logout from Telnet/SSH
Mar 31 14:29:11	NOTICE	mgmt: admin login from host 192.168.2.4
Mar 31 14:29:44	NOTICE	mgmt: admin logout from Telnet/SSH
Mar 31 14:29:50	NOTICE	mgmt: admin login from host 192.168.2.4
Mar 31 14:34:26	NOTICE	mgmt: admin idle timeout from Telnet/SSH
Mar 31 14:38:16	NOTICE	mgmt: admin login from host 192.168.2.4
Mar 31 14:43:34	NOTICE	mgmt: admin idle timeout from Telnet/SSH
Mar 31 14:43:48	NOTICE	mgmt: admin login from host 192.168.2.4
Mar 31 14:46:13	NOTICE	mgmt: admin logout from Telnet/SSH
Mar 31 14:56:21	NOTICE	mgmt: admin login from host 192.168.2.4
Mar 31 14:56:35	NOTICE	mgmt: boot config block changed
Mar 31 15:00:37	NOTICE	mgmt: admin idle timeout from Telnet/SSH
Mar 31 15:07:30	INFO	mgmt: new configuration applied
Mar 31 15:14:11	NOTICE	mgmt: admin login from host 255.255.255.255
Mar 31 15:14:12	NOTICE	mgmt: admin idle timeout from Telnet/SSH
Mar 31 15:44:08	NOTICE	mgmt: admin login from host 192.168.2.4
Mar 31 15:47:53	NOTICE	mgmt: admin idle timeout from Telnet/SSH
Mar 31 16:04:24	NOTICE	mgmt: admin login from host 192.168.2.4
Mar 31 16:17:18	NOTICE	mgmt: admin idle timeout from Telnet/SSH
Mar 31 16:39:44	INFO	mgmt: new configuration applied
Mar 31 16:40:09	INFO	mgmt: new configuration saved
Apr 1 9:43:44	ALERT	stp: STG 1, topology change detected
Apr 1 9:48:24	ALERT	stp: STG 1, topology change detected
Apr 1 9:55:50	ALERT	stp: STG 1, topology change detected
Apr 1 9:58:36	ALERT	stp: STG 1, topology change detected

Each message contains a date and time field and has a severity level associated with it. One of eight different prefixes is used to indicate the condition:

- **EMERG**—indicates the system is unusable
- **ALERT**—indicates action should be taken immediately
- **CRIT**—indicates critical conditions
- **ERR**—indicates error conditions or eroded operations
- **WARNING**—indicates warning conditions
- **NOTICE**—indicates a normal but significant condition
- **INFO**—indicates an information message
- **DEBUG**—indicates a debug-level message

Link Status Information

Command: **/info/link**

Port	Speed	Duplex	Flow Ctrl		Link
			TX	RX	
1	any	any	yes	yes	down
2	any	any	yes	yes	down
3	1000	full	yes	yes	down
4	100	full	yes	yes	down
5	any	any	yes	yes	down
6	any	any	yes	yes	down
7	any	any	yes	yes	down
8	1000	full	no	yes	up
9	100	full	yes	yes	down
10	100	full	yes	yes	down
11	any	any	yes	yes	down
12	any	any	yes	yes	down
13	any	any	yes	yes	down
14	any	any	yes	yes	down
15	any	any	yes	yes	down
16	any	any	yes	yes	down
17	100	full	yes	yes	down
18	100	full	yes	yes	down
19	100	full	yes	yes	down
20	100	full	yes	yes	down
21	1000	full	yes	yes	down
22	any	any	yes	yes	down
23	any	any	yes	yes	down
24	any	any	yes	yes	down

Use this command to display link status information about each port on a GbE2 Interconnect Switch, including:

- Port number
- Port speed (10 Mb/s, 100 Mb/s, 1000 Mb/s, or any)
- Duplex mode (half, full, or any)
- Flow control for transmit and receive (no, yes, or any)
- Link status (up or down)

Spanning Tree Information

Command: **/info/stp**

Spanning Tree Group 1: On							
Current Root:		Path-Cost	Port	Hello	MaxAge	FwdDel	Aging
8000 00:03:42:fa:3b:80		0	0	2	20	15	300
Parameters:		Priority	Hello	MaxAge	FwdDel	Aging	
		32768	2	20	15	300	
Port	Priority	Cost	State	Designated Bridge		Des Port	
----	-----	----	-----	-----		-----	
1	128	5	FORWARDING	8000-00:03:42:fa:3b:80		32769	
2	128	5	FORWARDING	8000-00:03:42:fa:3b:80		32770	
3	128	0	DISABLED				
4	128	0	DISABLED				
5	128	0	DISABLED				
6	128	0	DISABLED				
7	128	0	DISABLED				
8	128	0	DISABLED				
9	128	0	DISABLED				
10	128	0	DISABLED				
11	128	10	FORWARDING	8000-00:03:42:fa:3b:80		32779	
12	128	0	DISABLED				

The GbE2 Interconnect Switch software uses the IEEE 802.1D Spanning Tree Protocol (STP). In addition to seeing if STP is enabled or disabled, you can view the following STP bridge information:

- Current root MAC address
- Path-Cost
- Port
- Hello interval
- Maximum age value
- Forwarding delay
- Aging time

You can also see the following port-specific STP information:

- Port number and priority
- Cost
- State
- Designated bridge
- Designated port

The following table describes the STP parameters.

Table 4-5: STP Parameters

Parameter	Description
Path-Cost	The port path cost is used to help determine the designated port for a segment. Generally speaking, the faster the port, the lower the path cost.
Port	The current root port refers to the port on the GbE2 Interconnect Switch that receives data from the current root. Zero (0) indicates the root bridge of the STP.
Priority (bridge)	The bridge priority parameter controls which bridge on the network will become the STP root bridge.
Hello	The hello time parameter specifies, in seconds, how often the root bridge transmits a configuration bridge protocol data unit (BPDU). Any bridge that is not the root bridge uses the root bridge hello value.
MaxAge	The maximum age parameter specifies, in seconds, the maximum time the bridge waits without receiving a configuration bridge protocol data unit before it reconfigures the STP network.
FwdDel	The forward delay parameter specifies, in seconds, the amount of time that a bridge port has to wait before it changes from learning state to forwarding state.
Aging	The aging time parameter specifies, in seconds, the amount of time the bridge waits without receiving a packet from a station before removing the station from the Forwarding Database.
Priority (port)	The port priority parameter helps determine which bridge port becomes the designated port. In a network topology that has multiple bridge ports connected to a single segment, the port with the lowest port priority becomes the designated port for the segment.
Cost	The port path cost parameter is used to help determine the designated port for a segment. Generally speaking, the faster the port, the lower the path cost. A setting of zero (0) indicates that the cost will be set to the appropriate default after the link speed has been auto-negotiated.
State	The State field shows the current state of the port. The State field can be BLOCKING, LISTENING, LEARNING, FORWARDING, or DISABLED.
Designated bridge	The designated bridge is the Layer 2 device in a local area network (LAN) segment that is elected to perform the forwarding actions.
Designated port	Each designated port has a reference number that consists of the physical port number plus the bridge priority.

VLAN Information

Command: **/info/vlan**

VLAN	Name	Status	Ports
1	Default VLAN	ena	4 5
2	pc03p	ena	2
7	pc07f	ena	7
11	pc04u	ena	11
14	8600-14	ena	14
15	8600-15	ena	15
16	8600-16	ena	16
17	8600-17	ena	17
18	35k-1	ena	18
19	35k-2	ena	19
20	35k-3	ena	20
21	35k-4	ena	21
22	pc07z	ena	22
24	redlan	ena	24
300	ixiaTraffic	ena	1 12 13 23
4000	bpsports	ena	3-6 8-10

This information display includes all configured VLANs and all member ports that have an active link state.

VLAN information includes:

- VLAN Number
- VLAN Name
- Status
- Port membership of the VLAN

Port Information

Command: **/info/port**

Port	Tag	PVID	NAME	VLAN (s)
1	n	300	Server1_Port1	300
2	n	2	Server1_Port2	2
3	n	4000	Server2_Port1	4000
4	n	4000	Server2_Port2	4000
5	n	4000	Server3_Port1	4000
6	n	4000	Server3_Port2	4000
7	n	7	Server4_Port1	7
8	n	4000	Server4_Port2	4000
9	n	4000	Server5_Port1	4000
10	n	4000	Server5_Port2	4000
11	n	11	Server6_Port1	11
12	n	300	Server6_Port2	300
13	n	300	Server7_Port1	300
14	n	14	Server7_Port2	14
15	n	15	Server8_Port1	15
16	n	16	Server8_Port2	16
17	n	17	XConnect_1	17
18	n	18	XConnect_2	18
19	n	19	U1_Port_19	19
20	n	20	U1_Port_20	20
21	n	20	U2_Port_21	20
22	n	20	U2_Port_22	20
23	n	4091	FrontPanel1	4091
24	n	4092	FrontPanel2	4092

Port information includes:

- Port number
- Whether the port uses VLAN tagging or not (**y** or **n**)
- Port VLAN ID (PVID)
- Port name
- VLAN membership

IP Information

Command: **/info/ip**

```
Interface information:
 1: 47.80.23.243      255.255.254.0    47.80.23.255,    vlan 1, up
Default gateway information:
 1: 47.80.22.1,      vlan any,  up
 2: 47.80.225.2,     vlan any,  up
```

The following interface and default gateway information is displayed:

- Interface number
- IP address
- IP mask
- IP broadcast address
- VLAN membership
- Operational status

Trunk Group Information

Command: **/info/trunk**

```
Trunk group 1, port state:
 1: STG  1 forwarding
 2: STG  1 forwarding
```

When trunk groups are configured, you can view the state of each port in the various trunk groups.

NOTE: If Spanning Tree Protocol on any port in the trunk group is set to forwarding, the remaining ports in the trunk group will also be set to forwarding.

Clear Syslog Messages

Command: **/info/clrlog**

This command clears the syslog messages. Refer to the “Show Last 30 Syslog Messages” section earlier in this chapter for more information.

Information Dump

Command: **/info/dump**

Use the **dump** command to dump all GbE2 Interconnect Switch information available from the **Information Menu** (10K or more, depending on your configuration). This data is useful for tuning and debugging GbE2 Interconnect Switch performance.

If you want to capture dump data to a file, set the communication software on your workstation to capture session data prior to issuing the dump commands.

The Statistics Menu

Introduction

You can view GbE2 Interconnect Switch performance statistics in both the user, operator, and administrator command modes. This chapter discusses how to use the CLI to display GbE2 Interconnect Switch statistics.

Statistics Menu

Command: **/stats**

```
[Statistics Menu]
  port      - Port Stats Menu
  mp        - MP-specific Stats Menu
  if        - Show IP interface ("if") stats
  ip        - Show IP stats
  icmp      - Show ICMP stats
  tcp       - Show TCP stats
  udp       - Show UDP stats
  snmp      - Show SNMP stats
  fdb       - Show FDB stats
  arp       - Show ARP stats
  dns       - Show DNS stats
  ifclear   - Clear IP interface ("if") stats
  ipclear   - Clear IP stats
  dump      - Dump all stats
```

The following table describes the **Statistics Menu** options.

Table 5-1: Statistics Menu Options

Command	Usage
port <1-24>	Displays the Port Statistics Menu for the specified port. Use this command to display traffic statistics on a port-by-port basis. Traffic statistics are included in SNMP Management Information Base (MIB) objects.
mp	Displays the Management Processor Statistics Menu . Use this command to view information on how GbE2 Interconnect Switch management processes and resources are currently being allocated.

continued

Table 5-1: Statistics Menu Options *continued*

Command	Usage
if <i><interface number (1-256)></i>	Displays Internet Protocol (IP) interface statistics for the management processors.
ip	Displays IP statistics.
icmp	Displays Internet Control Messaging Protocol (ICMP) statistics.
tcp	Displays Transmission Control Protocol (TCP) statistics.
udp	Displays User Datagram Protocol (UDP) statistics.
snmp	Displays Simple Network Management Protocol (SNMP) statistics.
fdb	Displays Forwarding Database (FDB) statistics.
arp	Displays Address Resolution Protocol (ARP) statistics.
dns	Displays Domain Name Server (DNS) statistics.
ifclear	Clears IP interface (IF) statistics. Use this command with caution as it will delete all the IP interface statistics.
ipclear	Clears IP statistics. Use this command with caution as it will delete all the IP statistics.
dump	Dumps all GbE2 Interconnect Switch statistics. Use this command to gather data for tuning and debugging GbE2 Interconnect Switch performance. If you want to capture dump data to a file, set your communication software on your workstation to capture session data prior to issuing the dump command.

Port Statistics Menu

Command: **/stats/port** *<port number>*

```
[Port Statistics Menu]
  brg      - Show bridging ("dot1") stats
  ether    - Show Ethernet ("dot3") stats
  if       - Show interface ("if") stats
  link     - Show link stats
  clear    - Clear all port stats
```

This menu displays traffic statistics on a port-by-port basis.

The following table describes the **Port Statistics Menu** options:

Table 5-2: Port Statistics Menu Options

Command	Usage
brg	Displays bridging (“dot1”) statistics for the port.
ether	Displays Ethernet (“dot3”) statistics for the port.
if	Displays interface statistics for the port.
link	Displays link statistics for the port.
clear	This command clears all the statistics on the port.

Bridging Statistics

Command: **/stats/port <port number>/brg**

```
Bridging statistics for port 1:
dot1PortInFrames:           63242584
dot1PortOutFrames:          63277826
dot1PortInDiscards:         0
dot1TpLearnedEntryDiscards: 0
dot1BasePortDelayExceededDiscards: NA
dot1BasePortMtuExceededDiscards: NA
dot1StpPortForwardTransitions: 0
```

The following table describes the bridging statistics for a selected port:

Table 5-3: Bridging Statistics for Port

Statistics	Description
dot1PortInFrames	<p>The number of frames that have been received by this port from its segment.</p> <p>A frame received on the interface corresponding to this port is counted by this object, if and only if, it is for a protocol being processed by the local bridging function, including bridge management frames.</p>
dot1PortOutFrames	<p>The number of frames that have been transmitted by this port to its segment.</p> <p>A frame transmitted on the interface corresponding to this port is counted by this object, if and only if, it is for a protocol being processed by the local bridging function, including bridge management frames.</p>

continued

Table 5-3: Bridging Statistics for Port *continued*

Statistics	Description
dot1PortInDiscards	Count of valid frames received which were discarded (that is, filtered) by the forwarding process.
dot1TpLearnedEntryDiscards	<p>The total number of Forwarding Database entries, which have been or would have been learned, but have been discarded due to a lack of space to store them in the Forwarding Database.</p> <p>If this counter is increasing, it indicates that the Forwarding Database is regularly becoming full (a condition which has adverse performance effects on the subnetwork).</p> <p>If this counter has a significant value but is not presently increasing, it indicates that the problem has been occurring but is not persistent.</p>
dot1BasePortDelayExceededDiscards	The number of frames discarded by this port due to excessive transit delay through the bridge. It is incremented by both transparent and source route bridges.
dot1BasePortMtuExceededDiscards	The number of frames discarded by this port due to an excessive size. It is incremented by both transparent and source route bridges.
dot1StpPortForwardTransitions	The number of times this port has transitioned from the Learning state to the Forwarding state.

Ethernet Statistics

Command: `/stats/port <port number>/ether`

Ethernet statistics for port 1:	
dot3StatsAlignmentErrors:	0
dot3StatsFCSErrors:	0
dot3StatsSingleCollisionFrames:	0
dot3StatsMultipleCollisionFrames:	0
dot3StatsSQETestErrors:	NA
dot3StatsDeferredTransmissions:	0
dot3StatsLateCollisions:	0
dot3StatsExcessiveCollisions:	0
dot3StatsInternalMacTransmitErrors:	NA
dot3StatsCarrierSenseErrors:	0
dot3StatsFrameTooLongs:	0
dot3StatsInternalMacReceiveErrors:	0
dot3CollFrequencies [1-15]:	NA

The following table describes the Ethernet statistics for a selected port:

Table 5-4: Ethernet Statistics for Port

Statistics	Description
dot3StatsAlignmentErrors	<p>A count of frames received on a particular interface that are not an integral number of octets in length and do not pass the Frame Check Sequence (FCS) check.</p> <p>The count represented by an instance of this object is incremented when the alignmentError status is returned by the MAC service to the Logical Link Control (LLC) (or other MAC user).</p> <p>Received frames for which multiple error conditions obtained are, according to the conventions of IEEE 802.3 Layer Management, counted exclusively according to the error status presented to the LLC.</p>
dot3StatsFCSErrors	<p>A count of frames received on a particular interface that are an integral number of octets in length but do not pass the Frame Check Sequence (FCS) check.</p> <p>The count represented by an instance of this object is incremented when the frameCheckError status is returned by the MAC service to the LLC (or other MAC user).</p> <p>Received frames for which multiple error conditions obtained are, according to the conventions of IEEE 802.3 Layer Management, counted exclusively according to the error status presented to the LLC.</p>

continued

Table 5-4: Ethernet Statistics for Port *continued*

Statistics	Description
dot3StatsSingleCollisionFrames	<p>A count of successfully transmitted frames on a particular interface for which transmission is inhibited by exactly one collision.</p> <p>A frame that is counted by an instance of this object is also counted by the corresponding instance of either the ifOutUcastPkts, ifOutMulticastPkts, or ifOutBroadcastPkts, and is not counted by the corresponding instance of the dot3StatsMultipleCollisionFrame object.</p>
dot3StatsMultipleCollisionFrames	<p>A count of successfully transmitted frames on a particular interface for which transmission is inhibited by more than one collision.</p> <p>A frame that is counted by an instance of this object is also counted by the corresponding instance of either the ifOutUcastPkts, ifOutMulticastPkts, or ifOutBroadcastPkts, and is not counted by the corresponding instance of the dot3StatsSingleCollisionFrames object.</p>
dot3StatsSQETestErrors	<p>A count of times that the SQE TEST ERROR message is generated by the PLS sublayer for a particular interface.</p> <p>The SQE TEST ERROR message is defined in section 7.2.2.2.4 of ANSI/IEEE 802.3-1985 and its generation is described in section 7.2.4.6 of the same document.</p>
dot3StatsDeferredTransmissions	<p>A count of frames for which the first transmission attempt on a particular interface is delayed because the medium is busy.</p> <p>The count represented by an instance of this object does not include frames involved in collisions.</p>
dot3StatsLateCollisions	<p>The number of times that a collision is detected on a particular interface later than 512 bit-times into the transmission of a packet.</p> <p>Five hundred and twelve bit-times corresponds to 51.2 microseconds on a 10 Mb/s system. A (late) collision included in a count represented by an instance of this object is also considered as a (generic) collision for purposes of other collision-related statistics.</p>
dot3StatsExcessiveCollisions	<p>A count of frames for which transmission on a particular interface fails due to excessive collisions.</p>

continued

Table 5-4: Ethernet Statistics for Port *continued*

Statistics	Description
dot3StatsInternalMacTransmitErrors	<p>A count of frames for which transmission on a particular interface fails due to an internal MAC sublayer transmit error.</p> <p>A frame is only counted by an instance of this object if it is not counted by the corresponding instance of either the dot3StatsLateCollisions object, the dot3StatsExcessiveCollisions object, or the dot3StatsCarrierSenseErrors object.</p> <p>The precise meaning of the count represented by an instance of this object is implementation specific. In particular, an instance of this object may represent a count of transmission errors on a particular interface that are not otherwise counted.</p>
dot3StatsCarrierSenseErrors	<p>The number of times that the carrier sense condition was lost or never asserted when attempting to transmit a frame on a particular interface.</p> <p>The count represented by an instance of this object is incremented at most once per transmission attempt, even if the carrier sense condition fluctuates during a transmission attempt.</p>
dot3StatsFrameTooLongs	<p>A count of frames received on a particular interface that exceed the maximum permitted frame size.</p> <p>The count represented by an instance of this object is incremented when the frameTooLong status is returned by the MAC service to the LLC (or other MAC user).</p> <p>Received frames for which multiple error conditions obtained are, according to the conventions of IEEE 802.3 Layer Management, counted exclusively according to the error status presented to the LLC.</p>

continued

Table 5-4: Ethernet Statistics for Port *continued*

Statistics	Description
dot3StatsInternalMacReceiveErrors	<p>A count of frames for which reception on a particular interface fails due to an internal MAC sublayer receive error.</p> <p>A frame is only counted by an instance of this object if it is not counted by the corresponding instance of either the dot3StatsFrameTooLongs object, the dot3StatsAlignmentErrors object, or the dot3StatsFCSErrors object.</p> <p>The precise meaning of the count represented by an instance of this object is implementation specific. In particular, an instance of this object may represent a count of received errors on a particular interface that are not otherwise counted.</p>
dot3CollFrequencies	<p>A count of individual MAC frames for which the transmission (successful or otherwise) on a particular interface occurs after the frame has experienced exactly the number of collisions in the associated dot3CollCount object.</p> <p>For example, a frame which is transmitted on interface 77 after experiencing exactly 4 collisions would be indicated by incrementing only dot3CollFrequencies 77.4. No other instance of dot3CollFrequencies would be incremented in this example.</p>

Interface Statistics

Command: `/stats/port <port number>/if`

Interface statistics for port 1:		
	ifHCIn Counters	ifHCOut Counters
Octets:	51697080313	51721056808
UcastPkts:	65356399	65385714
BroadcastPkts:	0	6516
MulticastPkts:	0	0
Discards:	0	0
Errors:	0	21187

The following table describes the interface (IF) statistics for a selected port:

Table 5-5: Interface Statistics for Port

Statistics	Description
Octets—IfHCIn	The total number of octets received on the interface, including framing characters.
UcastPkts—IfHCIn	The number of packets, delivered by this sublayer to a higher sublayer, which were not addressed to a multicast or broadcast address at this sublayer.
BroadcastPkts—IfHCIn	The number of packets, delivered by this sublayer to a higher sublayer, which were addressed to a broadcast address at this sublayer.
MulticastPkts—IfHCIn	The total number of packets, delivered by this sublayer. These are the packets that higher-level protocols requested to be transmitted, and which were addressed to a multicast address at this sublayer, including those that were discarded or not sent. For a MAC layer protocol, this includes both group and functional addresses.
Discards—IfHCIn	The number of inbound packets which were chosen to be discarded even though no errors were detected to prevent their being delivered to a higher-layer protocol. One possible reason for discarding such a packet could be to free up buffer space.
Errors—IfHCIn	For packet-oriented interfaces, the number of inbound packets that contained errors preventing them from being delivered to a higher-layer protocol. For character-oriented or fixed-length interfaces, the number of inbound transmission units that contained errors preventing them from being deliverable to a higher-layer protocol.

continued

Table 5-5: Interface Statistics for Port *continued*

Statistics	Description
Octets—IfHCOut	The total number of octets transmitted out of the interface, including framing characters.
UcastPkts—IfHCOut	The total number of packets that higher-level protocols requested to be transmitted, and which were not addressed to a multicast or broadcast address at this sublayer, including those that were discarded or not sent.
BroadcastPkts—IfHCOut	The total number of packets that higher-level protocols requested to be transmitted, and which were addressed to a broadcast address at this sublayer, including those that were discarded or not sent. This object is a 64-bit version of ifOutBroadcastPkts .
MulticastPkts—IfHCOut	<p>The total number of packets that higher-level protocols requested to be transmitted, and which were addressed to a multicast address at this sublayer, including those that were discarded or not sent.</p> <p>For a MAC layer protocol, this includes both group and functional addresses. This object is a 64-bit version of ifOutMulticastPkts.</p>
Discards—IfHCOut	The number of outbound packets which were chosen to be discarded even though no errors had been detected to prevent their being transmitted. One possible reason for discarding such a packet could be to free up buffer space.
Errors—IfHCOut	<p>For packet-oriented interfaces, the number of outbound packets that could not be transmitted because of errors.</p> <p>For character-oriented or fixed-length interfaces, the number of outbound transmission units that could not be transmitted because of errors.</p>

Link Statistics

Command: `/stats/port <port number>/link`

```
Link statistics for port 1:
linkStateChange:      1
```

The following table describes the link statistics for a port:

Table 5-6: Link Statistics

Statistics	Description
<code>linkStateChange</code>	The total number of link state changes.

Management Processor Statistics

Command: `/stats/mp`

```
[MP-specific Statistics Menu]
  pkt      - Show Packet stats
  tcb      - Show All TCP control blocks in use
  ucb      - Show All UDP control blocks in use
  sfd      - Show All Socket FD in use
  cpu      - Show CPU utilization
```

The following table describes the **MP-specific Statistics Menu** options:

Table 5-7: MP-specific Statistics Menu

Command	Usage
<code>pkt</code>	Displays packet statistics, to check for leads and load.
<code>tcb</code>	Displays all Transmission Control Protocol (TCP) control blocks (TCB) that are in use.
<code>ucb</code>	Displays all User Datagram Protocol (UDP) control blocks (UCB) that are in use.
<code>sfd</code>	Displays all Socket File Descriptors (SFD) that are in use.
<code>cpu</code>	Displays CPU utilization for periods of up to 1, 4, and 64 seconds.

MP Packet Statistics

Command: **/stats/mp/pkt**

Packet counts:			
allocs:	1166996	freese:	1166996
mediums:	0	mediums hi-watermark:	7
jumbos:	0	jumbos hi-watermark:	0
smalls:	0	smalls hi-watermark:	7
failures:	0		

The following table describes the packet count statistics:

Table 5-8: Packet Statistics

Statistics	Description
allocs	Total number of packet allocations from the packet buffer pool by the TCP/IP protocol stack.
mediums	Total number of packet allocations with size between 128 to 1536 bytes from the packet buffer pool by the TCP/IP protocol stack.
jumbos	Total number of packet allocations with size larger than 1536 bytes from the packet buffer pool by the TCP/IP protocol stack.
smalls	Total number of packet allocations with size less than 128 bytes from the packet buffer pool by the TCP/IP protocol stack.
failures	Total number of packet allocation failures from the packet buffer pool by the TCP/IP protocol stack.
freese	Total number of packets freed from the packet buffer pool by the TCP/IP protocol stack.
mediums hi-watermark	The highest number of packet allocation with size between 128 to 1536 bytes from the packet buffer pool by the TCP/IP protocol stack.
jumbos hi-watermark	The highest number of packet allocation with size larger than 1536 bytes from the packet buffer pool by the TCP/IP protocol stack.
smalls hi-watermark	The highest number of packet allocation with size less than 128 bytes from the packet buffer pool by the TCP/IP protocol stack.

TCP Statistics

Command: **/stats/mp/tcb**

```
All TCP allocated control blocks:
10ad41e8:  0.0.0.0          0 <=> 0.0.0.0          80  listen
10ad5790:  47.81.27.5         1171 <=> 47.80.23.243    23  established
```

The following table describes the Transmission Control Protocol (TCP) control block (TCB) statistics shown in this example:

Table 5-9: MP Specified TCP Statistics

Description	Example Statistics
Memory	10ad41e8/10ad5790
Destination IP address	0.0.0.0/47.81.27.5
Destination port	0/1171
Source IP	0.0.0.0/47.80.23.243
Source port	80/23
State	listen/established

UCB Statistics

Command: **/stats/mp/ucb**

```
All UDP allocated control blocks:
161:  listen
```

The following table describes the User Datagram Protocol (UDP) control block (UCB) statistics shown in this example:

Table 5-10: UDP Statistics

Description	Example Statistic
Control block	161
State	listen

MP-specific SFD Statistics

Command: **/stats/mp/sfd**

```
All Socket FD allocated:
max_fdi=2
fdi=0 fd=15 pfdi=-1
10c27fd8: 0.0.0.0          0<=>47.133.108.161 80  listen TCP server
fdi=1 fd=16 pfdi=-1
10b9564c: 0.0.0.0          0<=>47.133.108.161 23 listen TCP server
fdi=2 fd=17 pfdi=1
10c27c78: 47.129.153.150 5341<=>47.133.108.161 23 accept TCP server
```

The Socket File Descriptors (SFD) statistics show information about the current management connections to the GbE2 Interconnect Switch. Each file descriptor index (fdi) lists the IP address and port number of the connecting party (if applicable), and the service port (http or Telnet) to which the connection is made. An index line that shows "listen" is waiting for a connection.

CPU Statistics

Command: **/stats/mp/cpu**

```
CPU utilization:
cpuUtil1Second:      53%
cpuUtil4Seconds:     54%
cpuUtil64Seconds:    54%
```

The following table describes the management port CPU utilization statistics:

Table 5-11: CPU Statistics

Statistics	Description
cpuUtil1Second	The utilization of MP CPU over 1 second. This is shown as a percentage.
cpuUtil4Seconds	The utilization of MP CPU over 4 seconds. This is shown as a percentage.
cpuUtil64Seconds	The utilization of MP CPU over 64 seconds. This is shown as a percentage.

Interface Statistics

Command: `/stats/if <interface number>`

IP interface 1 statistics:			
ifInOctets:	48948386	ifInUcastPkts:	220553
ifInNUCastPkts:	167895	ifInDiscards:	0
ifInErrors:	0	ifInUnknownProtos:	0
ifOutOctets:	27100789	ifOutUcastPkts:	441938
ifOutNUcastPkts:	218652	ifOutDiscards:	0
ifOutErrors:	0	ifStateChanges	1

The following table describes the IP interface statistics:

Table 5-12: Interface Statistics

Statistics	Description
ifInOctets	The total number of octets received on the interface, including framing characters.
ifInUcastPkts	The number of packets, delivered by this sublayer to a higher sublayer, which were not addressed to a multicast or broadcast address at this sublayer.
ifInNUCastPkts	The number of packets, delivered by this sublayer to a higher sublayer, which were addressed to a multicast or broadcast address at this sublayer. This object is deprecated in favor of ifInMulticastPkts and ifInBroadcastPkts .
ifInDiscards	The number of inbound packets that were chosen to be discarded even though no errors were detected to prevent their being delivered to a higher-layer protocol. One possible reason for discarding such a packet could be to free up buffer space.
ifInErrors	For packet-oriented interfaces, the number of inbound packets that contained errors preventing them from being delivered to a higher-layer protocol. For character-oriented or fixed-length interfaces, the number of inbound transmission units that contained errors preventing them from being deliverable to a higher-layer protocol.
ifInUnknownProtos	For packet-oriented interfaces, the number of packets received via the interface which were discarded because of an unknown or unsupported protocol. For character-oriented or fixed-length interfaces which support protocol multiplexing the number of transmission units received via the interface which were discarded because of an unknown or unsupported protocol. For any interface which does not support protocol multiplexing, this counter will always be zero (0).
ifOutOctets	The total number of octets transmitted out of the interface, including framing characters.

continued

Table 5-12: Interface Statistics *continued*

Statistics	Description
ifOutUcastPkts	The total number of packets that higher-level protocols requested to be transmitted, and which were not addressed to a multicast or broadcast address at this sublayer, including those that were discarded or not sent.
ifOutNUcastPkts	<p>The total number of packets that higher-level protocols requested to be transmitted, and which were addressed to a multicast or broadcast address at this sublayer, including those that were discarded or not sent.</p> <p>This object is deprecated in favor of ifOutMulticastPkts and ifOutBroadcastPkts.</p>
ifOutDiscards	The number of outbound packets, which were chosen to be discarded even though no errors had been detected to prevent their being transmitted. One possible reason for discarding such a packet could be to free up buffer space.
ifOutErrors	<p>For packet-oriented interfaces, the number of outbound packets that could not be transmitted because of errors.</p> <p>For character-oriented or fixed-length interfaces, the number of outbound transmission units that could not be transmitted because of errors.</p>
ifStateChanges	The number of times an interface has transitioned from either down to up or from up to down.

IP Statistics

Command: `/stats/ip`

IP statistics:			
ipInReceives:	3115873	ipInHdrErrors:	1
ipInAddrErrors:	35447	ipInUnknownProtos:	500504
ipInDiscards:	0	ipInDelivers:	2334166
ipOutRequests:	1010542	ipOutDiscards:	4
ipDefaultTTL:	255		

The following table describes the IP statistics:

Table 5-13: IP Statistics

Statistics	Description
ipInReceives	The total number of input datagrams received from interfaces, including those received in error.
ipInHdrErrors	The number of input datagrams discarded due to errors in their IP headers, including bad checksums, version number mismatch, other format errors, time-to-live exceeded, errors discovered in processing their IP options, and so on.
ipInAddrErrors	<p>The number of input datagrams discarded because the IP address in their IP header destination field was not a valid address to be received at this GbE2 Interconnect Switch. This count includes invalid addresses (for example, 0.0.0.0) and addresses of unsupported classes (for example, Class E).</p> <p>For entities which are not IP gateways and therefore do not forward datagrams, this counter includes datagrams discarded because the destination address was not a local address.</p>
ipInUnknownProtos	The number of locally addressed datagrams received successfully but discarded because of an unknown or unsupported protocol.
ipInDiscards	<p>The number of input IP datagrams for which no problems were encountered to prevent their continued processing, but which were discarded (for example, for lack of buffer space).</p> <p>This counter does not include any datagrams discarded while awaiting re-assembly.</p>

continued

Table 5-13: IP Statistics *continued*

Statistics	Description
ipInDelivers	The total number of input datagrams successfully delivered to IP user-protocols (including ICMP).
ipOutRequests	The total number of IP datagrams which local IP user-protocols (including ICMP) supplied to IP in requests for transmission. This counter does not include any datagrams counted in ipForwDatagrams .
ipOutDiscards	The number of output IP datagrams for which no problem was encountered to prevent their transmission to their destination, but which were discarded (for example, for lack of buffer space). This counter would include datagrams counted in ipForwDatagrams if any such packets met this (discretionary) discard criterion.
ipDefaultTTL	The default value inserted into the Time-To-Live (TTL) field of the IP header of datagrams originated at this GbE2 Interconnect Switch, whenever a TTL value is not supplied by the transport layer protocol.

ICMP Statistics

Command: `/stats/icmp`

ICMP statistics:			
icmpInMsgs:	245802	icmpInErrors:	1393
icmpInDestUnreachs:	41	icmpInTimeExcds:	0
icmpInParmProbs:	0	icmpInSrcQuenchs:	0
icmpInRedirects:	0	icmpInEchos:	18
icmpInEchoReps:	244350	icmpInTimestamps:	0
icmpInTimestampReps:	0	icmpInAddrMasks:	0
icmpInAddrMaskReps:	0	icmpOutMsgs:	253810
icmpOutErrors:	0	icmpOutDestUnreachs:	15
icmpOutTimeExcds:	0	icmpOutParmProbs:	0
icmpOutSrcQuenchs:	0	icmpOutRedirects:	0
icmpOutEchos:	253777	icmpOutEchoReps:	18
icmpOutTimestamps:	0	icmpOutTimestampReps:	0
icmpOutAddrMasks:	0	icmpOutAddrMaskReps:	0

The following table describes the Internet Control Messaging Protocol (ICMP) statistics:

Table 5-14: ICMP Statistics

Statistics	Description
icmpInMsgs	The total number of ICMP messages which the GbE2 Interconnect Switch received. Note that this counter includes all those counted by icmpInErrors .
icmpInErrors	The number of ICMP messages which the GbE2 Interconnect Switch received but determined as having ICMP specific errors (for example bad ICMP checksums and bad length).

continued

Table 5-14: ICMP Statistics *continued*

Statistics	Description
icmpInDestUnreachs	The number of ICMP Destination Unreachable messages received.
icmpInTimeExcds	The number of ICMP Time Exceeded messages received.
icmpInParmProbs	The number of ICMP Parameter Problem messages received.
icmpInSrcQuenchs	The number of ICMP Source Quench (buffer almost full, stop sending data) messages received.
icmpInRedirects	The number of ICMP Redirect messages received.
icmpInEchos	The number of ICMP Echo (request) messages received.
icmpInEchoReps	The number of ICMP Echo Reply messages received.
icmpInTimestamps	The number of ICMP Timestamp (request) messages received.
icmpInTimestampReps	The number of ICMP Timestamp Reply messages received.
icmpInAddrMasks	The number of ICMP Address Mask Request messages received.
icmpInAddrMaskReps	The number of ICMP Address Mask Reply messages received.
icmpOutMsgs	The total number of ICMP messages which this GbE2 Interconnect Switch attempted to send. Note that this counter includes all those counted by icmpOutErrors .
icmpOutErrors	The number of ICMP messages which this GbE2 Interconnect Switch did not send due to problems discovered within ICMP such as a lack of buffer. This value should not include errors discovered outside the ICMP layer such as the inability of IP to route the resultant datagram. In some implementations there may be no types of errors that contribute to this counter's value.
icmpOutDestUnreachs	The number of ICMP Destination Unreachable messages sent.
icmpOutTimeExcds	The number of ICMP Time Exceeded messages sent.
icmpOutParmProbs	The number of ICMP Parameter Problem messages sent.
icmpOutSrcQuenchs	The number of ICMP Source Quench (buffer almost full, stop sending data) messages sent.
icmpOutRedirects	The number of ICMP Redirect messages sent.
icmpOutEchos	The number of ICMP Echo (request) messages sent.
icmpOutEchoReps	The number of ICMP Echo Reply messages sent.
icmpOutTimestamps	The number of ICMP Timestamp (request) messages sent.
icmpOutTimestampReps	The number of ICMP Timestamp Reply messages sent.
icmpOutAddrMasks	The number of ICMP Address Mask Request messages sent.
icmpOutAddrMaskReps	The number of ICMP Address Mask Reply messages sent.

TCP Statistics

Command: **/stats/tcp**

```

TCP statistics:
tcpRtoAlgorithm:      4      tcpRtoMin:      0
tcpRtoMax:           240000  tcpMaxConn:     512
tcpActiveOpens:      252214  tcpPassiveOpens: 7
tcpAttemptFails:      528    tcpEstabResets:  4
tcpInSegs:           756401  tcpOutSegs:     756655
tcpRetransSegs:       0      tcpInErrs:      0
tcpCurBuff:          0      tcpCurConn:     3
tcpOutRsts:           417

```

The following table describes the Transmission Control Protocol (TCP) statistics:

Table 5-15: TCP Statistics

Statistics	Description
tcpRtoAlgorithm	The algorithm used to determine the timeout value used for retransmitting unacknowledged octets.
tcpRtoMin	The minimum value permitted by a TCP implementation for the retransmission timeout, measured in milliseconds. More refined semantics for objects of this type depend upon the algorithm used to determine the retransmission timeout. In particular, when the timeout algorithm is rsre(3), an object of this type has the semantics of the LBOUND quantity described in Request For Comments (RFC) 793.
tcpRtoMax	The maximum value permitted by a TCP implementation for the retransmission timeout, measured in milliseconds. More refined semantics for objects of this type depend upon the algorithm used to determine the retransmission timeout. In particular, when the timeout algorithm is rsre(3), an object of this type has the semantics of the UBOUND quantity described in RFC 793.
tcpMaxConn	The limit on the total number of TCP connections the GbE2 Interconnect Switch can support. In entities where the maximum number of connections is dynamic, this object should contain the value -1.
tcpActiveOpens	The number of times TCP connections have made a direct transition to the SYN-SENT state from the CLOSED state.
tcpPassiveOpens	The number of times TCP connections have made a direct transition to the SYN-RCVD state from the LISTEN state.

continued

Table 5-15: TCP Statistics *continued*

Statistics	Description
tcpAttemptFails	The number of times TCP connections have made a direct transition to the CLOSED state from either the SYN-SENT state or the SYN-RCVD state, plus the number of times TCP connections have made a direct transition to the LISTEN state from the SYN-RCVD state.
tcpEstabResets	The number of times TCP connections have made a direct transition to the CLOSED state from either the ESTABLISHED state or the CLOSE- WAIT state.
tcpInSegs	The total number of segments received, including those received in error. This count includes segments received on currently established connections.
tcpOutSegs	The total number of segments sent, including those on current connections but excluding those containing only retransmitted octets.
tcpRetransSegs	The total number of segments retransmitted, that is, the number of TCP segments transmitted containing one or more previously transmitted octets.
tcpInErrs	The total number of segments received in error (for example, bad TCP checksums).
tcpCurBuff	The total number of outstanding memory allocations from heap by TCP protocol stack.
tcpCurConn	The total number of outstanding TCP sessions that are currently opened.
tcpOutRsts	The number of TCP segments sent containing the reset (RST) flag.

UDP Statistics

Command: `/stats/udp`

```

UDP statistics:
udpInDatagrams:      54    udpOutDatagrams:      43
udpInErrors:         0    udpNoPorts:      1578077

```

The following table describes the User Datagram Protocol (UDP) statistics:

Table 5-16: UDP Statistics

Statistics	Description
udpInDatagrams	The total number of UDP datagrams delivered to the GbE2 Interconnect Switch.
udpOutDatagrams	The total number of UDP datagrams sent from this GbE2 Interconnect Switch.
udpInErrors	The number of received UDP datagrams that could not be delivered for reasons other than the lack of an application at the destination port.
udpNoPorts	The total number of received UDP datagrams for which there was no application at the destination port.

SNMP Statistics

Command: `/stats/snmp`

SNMP statistics:			
snmpInPkts:	54	snmpInBadVersions:	0
snmpInBadC'tyNames:	0	snmpInBadC'tyUses:	0
snmpInASNParseErrs:	0	snmpEnableAuthTraps:	0
snmpOutPkts:	54	snmpInBadTypes:	0
snmpInTooBigs:	0	snmpInNoSuchNames:	0
snmpInBadValues:	0	snmpInReadOnlys:	0
snmpInGenErrs:	0	snmpInTotalReqVars:	105
snmpInTotalSetVars:	0	snmpInGetRequests:	2
snmpInGetNexts:	52	snmpInSetRequests:	0
snmpInGetResponses:	0	snmpInTraps:	0
snmpOutTooBigs:	0	snmpOutNoSuchNames:	2
snmpOutBadValues:	0	snmpOutReadOnlys:	0
snmpOutGenErrs:	0	snmpOutGetRequests:	0
snmpOutGetNexts:	0	snmpOutSetRequests:	0
snmpOutGetResponses:	54	snmpOutTraps:	0

The following table describes the Simple Network Management Protocol (SNMP) statistics:

Table 5-17: SNMP Statistics

Statistics	Description
snmpInPkts	The total number of messages delivered to the SNMP entity from the transport service.
snmpInBadVersions	The total number of SNMP messages, which were delivered to the SNMP protocol entity and were for an unsupported SNMP version.
snmpInBadC'tyNames	The total number of SNMP messages delivered to the SNMP entity which used an SNMP community name not known to the GbE2 Interconnect Switch.
snmpInBadC'tyUses	The total number of SNMP messages delivered to the SNMP protocol entity which represented an SNMP operation which was not allowed by the SNMP community named in the message.
snmpInASNParseErrs	<p>The total number of ASN.1 (Abstract Syntax Notation One) or BER (Basic Encoding Rules), errors encountered by the SNMP protocol entity when decoding SNMP messages received.</p> <p>The Open Systems Interconnection (OSI) method of specifying abstract objects is called ASN.1 (Abstract Syntax Notation One, defined in X.208), and one set of rules for representing such objects as strings of ones and zeros is called the BER (Basic Encoding Rules, defined in X.209).</p> <p>ASN.1 is a flexible notation that allows one to define a variety of data types, from simple types such as integers and bit strings to structured types such as sets and sequences.</p> <p>BER describes how to represent or encode values of each ASN.1 type as a string of eight-bit octets.</p>

continued

Table 5-17: SNMP Statistics *continued*

Statistics	Description
snmpEnableAuthTraps	An object to enable or disable the authentication traps generated by this GbE2 Interconnect Switch.
snmpOutPkts	The total number of SNMP messages which were passed from the SNMP protocol entity to the transport service.
snmpInBadTypes	The total number of SNMP messages which failed ASN.1 parsing.
snmpInTooBig	The total number of SNMP Protocol Data Units (PDUs) which were delivered to the SNMP protocol entity and for which the value of the error-status field is too big.
snmpInNoSuchNames	The total number of SNMP Protocol Data Units (PDUs) which were delivered to the SNMP protocol entity and for which the value of the error-status field is noSuchName .
snmpInBadValues	The total number of SNMP Protocol Data Units (PDUs) which were delivered to the SNMP protocol entity and for which the value of the error-status field is badValue .
snmpInReadOnly	<p>The total number of valid SNMP Protocol Data Units (PDUs), which were delivered to the SNMP protocol entity and for which the value of the error-status field is read-only.</p> <p>It should be noted that it is a protocol error to generate an SNMP PDU, which contains the value read-only in the error-status field. As such, this object is provided as a means of detecting incorrect implementations of the SNMP.</p>
snmpInGenErrs	The total number of SNMP Protocol Data Units (PDUs), which were delivered to the SNMP protocol entity and for which the value of the error-status field is genErr .
snmpInTotalReqVars	The total number of MIB objects which have been retrieved successfully by the SNMP protocol entity as a result of receiving valid SNMP Get-Request and Get-Next Protocol Data Units (PDUs).
snmpInTotalSetVars	The total number of MIB objects, which have been altered successfully by the SNMP protocol entity as a result of receiving valid SNMP Set-Request Protocol Data Units (PDUs).
snmpInGetRequests	The total number of SNMP Get-Request Protocol Data Units (PDUs), which have been accepted and processed by the SNMP protocol entity.
snmpInGetNexts	The total number of SNMP Get-Next Protocol Data Units (PDUs), which have been accepted and processed by the SNMP protocol entity.
snmpInSetRequests	The total number of SNMP Set-Request Protocol Data Units (PDUs), which have been accepted and processed by the SNMP protocol entity.
snmpInGetResponses	The total number of SNMP Get-Response Protocol Data Units (PDUs), which have been accepted and processed by the SNMP protocol entity.

continued

Table 5-17: SNMP Statistics *continued*

Statistics	Description
snmpInTraps	The total number of SNMP Trap Protocol Data Units (PDUs), which have been accepted and processed by the SNMP protocol entity.
snmpOutTooBig	The total number of SNMP Protocol Data Units (PDUs), which were generated by the SNMP protocol entity and for which the value of the error-status field is too big.
snmpOutNoSuchNames	The total number of SNMP Protocol Data Units (PDUs), which were generated by the SNMP protocol entity and for which the value of the error-status is noSuchName .
snmpOutBadValues	The total number of SNMP Protocol Data Units (PDUs), which were generated by the SNMP protocol entity and for which the value of the error-status field is badValue .
snmpOutReadOnly	Not in use.
snmpOutGenErrs	The total number of SNMP Protocol Data Units (PDUs), which were generated by the SNMP protocol entity and for which the value of the error-status field is genErr .
snmpOutGetRequests	The total number of SNMP Get-Request Protocol Data Units (PDUs), which have been generated by the SNMP protocol entity.
snmpOutGetNexts	The total number of SNMP Get-Next Protocol Data Units (PDUs), which have been generated by the SNMP protocol entity.
snmpOutSetRequests	The total number of SNMP Set-Request Protocol Data Units (PDUs), which have been generated by the SNMP protocol entity.
snmpOutGetResponses	The total number of SNMP Get-Response Protocol Data Units (PDUs), which have been generated by the SNMP protocol entity.
snmpOutTraps	The total number of SNMP Trap Protocol Data Units (PDUs), which have been generated by the SNMP protocol entity.

FDB Statistics

Command: **/stats/fdb**

```
FDB statistics:
current:      83   hiwat:      855
```

This menu option enables you to display statistics regarding the use of the forwarding database, including the number of current entries and the maximum number of entries ever recorded.

The following table describes the Forwarding Database (FDB) statistics:

Table 5-18: Forwarding Database Statistics

Statistic	Description
current	Current number of entries in the Forwarding Database.
hiwat	Highest number of entries recorded at any given time in the Forwarding Database.

ARP statistics

Command: **/stats/arp**

```
ARP statistics:
arpEntriesCur:      2   arpEntriesHighWater:      4
```

The following table describes the Address Resolution Protocol (ARP) statistics:

Table 5-19: ARP Statistics

Statistics	Description
arpEntriesCur	The total number of outstanding ARP entries in the ARP table.
arpEntriesHighWater	The highest number of ARP entries ever recorded in the ARP table.

DNS Statistics

Command: **/stats/dns**

DNS statistics:			
dnsInRequests:	0	dnsOutRequests:	0
dnsBadRequests:	0		

The following table describes the Domain Name System (DNS) statistics:

Table 5-20: DNS Statistics

Statistics	Description
dnsInRequests	The total number of DNS request packets that have been received.
dnsOutRequests	The total number of DNS response packets that have been transmitted.
dnsBadRequests	The total number of DNS request packets received that were dropped.

Statistics Dump

Command: **/stats/dump**

Use the **dump** command to dump all GbE2 Interconnect Switch statistics available from the **Statistics Menu** (40K or more, depending on your configuration). This data can be used to tune or debug GbE2 Interconnect Switch performance.

If you want to capture dump data to a file, set your communication software on your workstation to capture session data prior to issuing the dump commands.

The Configuration Menu

Introduction

The **Configuration Menu** is only available from an administrator login. It includes submenus for configuring every aspect of the GbE2 Interconnect Switch. Changes to configuration are not active until explicitly applied. Changes can be saved to non-volatile memory (NVRAM).

Configuration Menu

Command: `/cfg`

```
[Configuration Menu]
  sys      - System-wide Parameter Menu
  port     - Port Menu
  ip       - IP Menu
  vlan     - VLAN Menu
  stp      - Spanning Tree Menu
  snmp     - SNMP Menu
  pmirr    - Port Mirroring Menu
  trunk    - Trunk Group Menu
  setup    - Step by step configuration set up
  dump     - Dump current configuration to script file
  ptcfg    - Backup current configuration to tftp server
  gtcfg    - Restore current configuration from tftp server
```

The following table describes the **Configuration Menu** options.

Table 6-1: Configuration Menu Options

Command	Usage
<code>sys</code>	Displays the System Configuration Menu .
<code>port <port number></code>	Displays the Port Configuration Menu .
<code>ip</code>	Displays the IP Configuration Menu .
<code>vlan <VLAN number></code>	Displays the VLAN Configuration Menu .
<code>stp <group number></code>	Displays the Spanning Tree Configuration Menu .
<code>snmp</code>	Displays the SNMP Configuration Menu .

continued

Table 6-1: Configuration Menu Options *continued*

Command	Usage
<code>pmirr</code>	Displays the Mirroring Configuration Menu .
<code>trunk <trunk group number></code>	Displays the Trunk Group Configuration Menu .
<code>setup</code>	Provides step-by-step configuration setup of the GbE2 Interconnect Switch.
<code>dump</code>	Dumps current configuration to a script file.
<code>ptcfg <host name or IP address of TFTP server> <filename on host></code>	Backs up current configuration to TFTP server.
<code>gtcfg <host name or IP address of TFTP server> <filename on host></code>	Restores current configuration from TFTP server.

Viewing, Applying, Reverting, and Saving Changes

As you use the configuration menus to set GbE2 Interconnect Switch parameters, the changes you make do not take effect immediately. All changes are considered pending until you explicitly apply them. Also, any changes are lost the next time the GbE2 Interconnect Switch boots unless the changes are explicitly saved.

While configuration changes are in the pending state, you can:

- View the pending changes
- Apply the pending changes
- Revert to restore configuration parameters set with the last **apply** command
- Save the changes to flash memory

Viewing Pending Changes

You can view all pending configuration changes by entering **diff** at any CLI prompt:

```
# diff
```

You can view all pending configuration changes that have been applied but not saved to flash memory by entering **diff flash** at any CLI prompt:

```
# diff flash
```


Applying Pending Changes

To make your configuration changes active, you must apply them. To apply configuration changes, enter the following command at any prompt:

```
# apply
```

IMPORTANT: All configuration changes take effect immediately when applied, except for starting Spanning Tree Protocol. To turn STP on or off, you must apply the changes, save them, and then reset the GbE2 Interconnect Switch. (Refer to the “Resetting the GbE2 Interconnect Switch” section in Chapter 8.)

Reverting Changes

The **revert** command removes configuration changes that have been made, but not applied. Enter **revert apply** to remove all changes that have not been saved:

```
# revert
```

Saving the Configuration

In addition to applying the configuration changes, you can save them to flash memory on the GbE2 Interconnect Switch.

IMPORTANT: If you do not save the changes, they will be lost the next time the system is rebooted.

To save the new configuration, enter the following command at any prompt:

```
# save
```

When you save configuration changes, the changes are saved to the active configuration block. The configuration being replaced by the save is first copied to the backup configuration block. If you do not want the previous configuration block copied to the backup configuration block, enter the following instead:

```
# save n
```

You can decide which configuration you want to run the next time you reset the GbE2 Interconnect Switch. Your options include:

- The active configuration block
- The backup configuration block
- Factory default configuration block

You can view all pending configuration changes that have been applied but not saved to flash memory using the **diff flash** command. It is a global command that can be executed from any prompt.

For instructions on selecting the configuration to run at the next system reset, refer to the “Selecting a Configuration Block” section in Chapter 8.

System Configuration

Command: `/cfg/sys`

```
[System Menu]
  syslog - Syslog Menu
  sshd   - SSH Server Menu
  radius - RADIUS Authentication Menu
  ntp     - NTP Server Menu
  date    - Set system date
  time    - Set system time
  idle    - Set timeout for idle CLI sessions
  snmp    - Set SNMP access control
  wport   - Set Web server port number
  notice  - Set login notice
  bannr   - Set login banner
  mnet    - Set management network
  mmask   - Set management netmask
  tnet    - Enable/disable Telnet access
  tnport  - Set Telnet server port number
  hprompt - Enable/disable display hostname (sysName) in CLI prompt
  bootp   - Enable/disable use of BOOTP
  http    - Enable/disable HTTP (Web) access
  user    - User Access Control Menu (passwords)
  tport   - Set the TFTP port for the system
  cur     - Display current system-wide parameters
```

This menu provides configuration of GbE2 Interconnect Switch management parameters such as user and administrator privilege mode passwords, browser-based management settings, and management access list.

The following table describes the **System Configuration Menu** options.

Table 6-2: System Configuration Menu Options

Command	Usage
<code>syslog</code>	Displays the Syslog Menu .
<code>sshd</code>	Displays the SSH Server Menu .
<code>radius</code>	Displays the RADIUS Authentication Menu .
<code>ntp</code>	Displays the Network Time Protocol (NTP) Server Menu .
<code>date</code>	Prompts the user for the system date.
<code>time</code>	Configures the system time using a 24-hour clock format.
<code>idle <idle timeout in minutes; affects both console and Telnet></code>	Sets the idle timeout for CLI sessions, from 1 to 60 minutes. The default is 5 minutes.

continued

Table 6-2: System Configuration Menu Options *continued*

Command	Usage
<code>snmp disable read-only read-write</code>	Disables or provides read-only/write-read SNMP access.
<code>wport <TCP port number></code>	Sets the GbE2 Interconnect Switch port used for serving GbE2 Interconnect Switch Web content. The default is HTTP port 80.
<code>notice <max 1024 char multi-line login notice> <'-' to end></code>	Displays login notice immediately before the "Enter password:" prompt. This notice can contain up to 1024 characters and new lines.
<code>bannr <string, maximum 80 characters></code>	Configures a login banner of up to 80 characters. When a user or administrator logs into the GbE2 Interconnect Switch, the login banner is displayed. It is also displayed as part of the output from the <code>/info/sys</code> command.
<code>mnet <IP subnet (such as 192.4.17.0)></code>	Sets the base source IP address that allows access to GbE2 Interconnect Switch management through Telnet, SSH, SNMP, or the GbE2 Interconnect Switch browser-based interface. A range of IP addresses is produced when used with <code>mmask</code> (below). Specify an IP address in dotted-decimal notation.
<code>mmask <IP subnet mask (such as 255.255.0.0)></code>	This IP address mask is used with <code>mnet</code> to set a range of source IP addresses allowed access to GbE2 Interconnect Switch management functions. Specify the mask in dotted-decimal notation.
<code>tnet disable enable</code>	Enables or disables Telnet access to the command line interface sessions. The default is enable. This command is available only from a local console connection.
<code>tnport <TCP port number></code>	Sets an optional Telnet server port number for cases where the server listens for Telnet sessions on a non-standard port. This command is available from Telnet and a local console connection, however, it is only valid to change from a local connection.
<code>hprompt disable enable</code>	Enables or disables displaying of the SNMP system in the command line interface.
<code>bootp disable enable</code>	Enables or disables the use of BOOTP. If you enable BOOTP, the GbE2 Interconnect Switch will query its BOOTP server for all of the GbE2 Interconnect Switch IP parameters. The default is enable.

continued

Table 6-2: System Configuration Menu Options *continued*

Command	Usage
<code>http disable enable</code>	Enables or disables HTTP (Web) access to the browser-based interface. The default is enable.
<code>user</code>	Displays the User Access Control Menu .
<code>tport <tftp port number></code>	Sets the GbE2 Interconnect Switch port used for serving TFTP. The default is TFTP port 69. If RDP is being used, this port will need to be changed to a different port.
<code>cur</code>	Displays the current system parameters.

System Host Log Configuration

Command: `/cfg/sys/syslog`

```
[Syslog Menu]
  host      - Set IP address of first syslog host
  host2     - Set IP address of second syslog host
  sever     - Set the severity of first syslog host
  sever2    - Set the severity of second syslog host
  console   - Enable/disable console output of syslog messages
  log       - Enable/disable syslogging of features
  cur       - Display current syslog settings
```

The following table describes the **Syslog Configuration Menu** options.

Table 6-3: Syslog Configuration Menu Options

Command	Description
<code>host <new syslog host IP address (such as, 192.4.17.223)></code>	Sets the IP address of the first syslog host.
<code>host2 <new syslog host IP address (such as, 192.4.17.223)></code>	Sets the IP address of the second syslog host.
<code>sever <syslog host local severity></code>	Sets the severity level of the first syslog host displayed. The default is 7, which means log all the seven severity levels.
<code>sever2 <syslog host local severity></code>	Sets the severity level of the second syslog host displayed. The default is 7, which means, log all the seven severity levels.
<code>console disable enable</code>	Enables or disables delivering syslog messages to the console. When necessary, disabling console ensures the GbE2 Interconnect Switch is not affected by syslog messages. It is enabled by default.

continued

Table 6-3: Syslog Configuration Menu Options *continued*

Command	Description
<code>log <feature all> <enable disable></code>	<ul style="list-style-type: none"> Displays a list of features for which syslog messages can be generated. You can choose to enable/disable specific features or enable/disable syslog on all available features. <p>Features include:</p> <ul style="list-style-type: none"> console system mgmt cli stp vlan ssh ntp ip web
<code>cur</code>	Displays the current syslog settings.

Secure Shell Server Configuration

Command: `/cfg/sys/sshd`

```

SSHD Menu]
interval- Set Interval for generating the RSA server key
scpadm - Set SCP-only admin password
hkeygen - Generate the RSA host key
skeygen - Generate the RSA server key
sshport - Set SSH server port number
ena      - Enable the SCP apply and save
dis      - Disable the SCP apply and save
on       - Turn SSH server ON
off      - Turn SSH server OFF
cur      - Display current SSH server configuration

```

Telnet traffic on the network is not secure. This menu enables Secure Shell (SSH) access from any SSH client. The SSH program securely logs into another computer over a network and executes commands in a secure environment. All data using SSH is encrypted.

Secure Shell can be configured on the GbE2 Interconnect Switch using the console port only. Several of the above menu options do not display if you access the GbE2 Interconnect Switch using Telnet.

NOTE: Only **sshport**, **ena**, **on**, and **cur** are accessible in non-console ports.

NOTE: Refer to the *HP ProLiant BL p-Class GbE2 Interconnect Switch Application Guide* for information on SSH.

The following table describes the **SSHD Configuration Menu** options.

Table 6-4: SSHD Configuration Menu Options

Command	Description
<code>intrval <interval (in hours), 1-24, 0 to disable></code>	Defines interval for auto-generating the RSA server key. The GbE2 Interconnect Switch will auto-generate the RSA server key at the interval defined in this command. The value of zero (0) means the RSA server key auto-generation is disabled. If the switch has been busy performing any other key generation and the assigned time of interval expires, the RSA server will skip generating the key.
<code>scpadm</code>	Defines the administrator password that is for Secure Copy (SCP) only. Typically, SCP is used to copy files from one machine to the other securely. In the GbE2 Interconnect Switch, SCP is used to download and upload the switch configuration using secure channels.
<code>hkeygen</code>	Generates the RSA host keys manually. The GbE2 Interconnect Switch creates this key automatically while configuring the switch with Secure Shell (SSH). But you can generate the key manually by using this command if you need to overwrite the key for security reasons. The command will take effect immediately without executing the apply command.
<code>skeygen</code>	Generates the RSA server key. The GbE2 Interconnect Switch creates this key automatically while configuring the switch with Secure Shell (SSH). You can generate the key manually by using this command if you need to overwrite the key for security reasons. The command will take effect immediately without executing the apply command.
<code>sshport <TCP port number></code>	Sets the SSH server port number.
<code>ena</code>	Enables the SCP apply and save.
<code>dis</code>	Disables the SCP apply and save. This is the default for SCP.
<code>on</code>	Enables the SSH server.
<code>off</code>	Disables the SSH server. This is the default for the SSH server.
<code>cur</code>	Displays the current SSH server configuration.

RADIUS Server Configuration

Command: `/cfg/sys/radius`

```
[RADIUS Server Menu]
  prsrv - Set primary RADIUS server address
  secsrv - Set secondary RADIUS server address
  secret - Set RADIUS secret
  port - Set RADIUS port
  retries - Set RADIUS server retries
  timeout - Set RADIUS server timeout
  telnet - Enable or disable RADIUS backdoor for telnet
  on - Turn RADIUS authentication ON
  off - Turn RADIUS authentication OFF
  cur - Display current RADIUS configuration
```

NOTE: Refer to the *HP ProLiant BL p-Class GbE2 Interconnect Switch Application Guide* for information on RADIUS.

The following table describes the **RADIUS Server Configuration Menu** options.

Table 6-5: RADIUS Server Configuration Menu Options

Command	Description
<code>prsrv <IP address></code>	Sets the primary RADIUS server address.
<code>secsrv <IP address></code>	Sets the secondary RADIUS server address.
<code>secret <1-32 character secret></code>	This is the shared secret between the GbE2 Interconnect Switch and the RADIUS server(s).
<code>port <RADIUS port configure, default 1645></code>	Enter the number of the User Datagram Protocol (UDP) port to be configured, between 1500-3000. The default is 1645.
<code>retries <RADIUS server retries></code>	Sets the number of failed authentication requests before switching to a different RADIUS server. The default is 3 requests.
<code>timeout <RADIUS server timeout seconds></code>	Sets the amount of time, in seconds, before a RADIUS server authentication attempt is considered to have failed. The default is 3 seconds.
<code>telnet disable enable</code>	Enables or disables the RADIUS backdoor for Telnet. Telnet also applies to SSH/SCP connections. The default is disable.
<code>on</code>	Enables the RADIUS server.
<code>off</code>	Disables the RADIUS server. This is the default.
<code>cur</code>	Displays the current RADIUS server parameters.

IMPORTANT: If RADIUS is enabled, you are required to login using RADIUS when doing Telnet. If a RADIUS server is not available and the Telnet backdoor is enabled, type in **noradius** as a backdoor to bypass RADIUS checking, and use the administrator password to log into the GbE2 Interconnect Switch. Using **noradius** is only allowed if the RADIUS server is not available.

NTP Server Configuration

Command: `/cfg/sys/ntp`

```
[NTP Server Menu]
server - Set NTP server address
interval - Set NTP server resync interval
tzone - Set NTP timezone offset from GMT
dlight - Enable or disable NTP daylight saving time
on - Turn NTP service ON
off - Turn NTP service OFF
cur - Display current NTP configuration
```

This menu enables you to synchronize the GbE2 Interconnect Switch clock to a Network Time Protocol (NTP) server. By default, this option is disabled.

The following table describes the **NTP Server Configuration Menu** options.

Table 6-6: NTP Server Configuration Menu Options

Command	Description
<code>server <NTP Server IP address></code>	Prompts for the IP addresses of the NTP server to which you want to synchronize the GbE2 Interconnect Switch clock.
<code>interval <resync interval in minutes></code>	Specifies the interval, that is, how often, in minutes (1-2880), to resynchronize the GbE2 Interconnect Switch clock with the NTP server.
<code>tzone <timezone offset, in HH:MM format></code>	Prompts for the NTP time zone offset from Greenwich Mean Time (GMT), in hours and minutes.
<code>dlight disable enable</code>	Disables or enables daylight saving time in the system clock. When enabled, the GbE2 Interconnect Switch will add an extra hour to the system clock so that it is consistent with the local clock. By default, this option is disabled.
<code>on</code>	Enables the NTP synchronization service.
<code>off</code>	Disables the NTP synchronization service. This is the default.
<code>cur</code>	Displays the current NTP service settings.

User Access Control Configuration

Command: **/cfg/sys/user**

```
[User Access Control Menu]
usrpw  - Set user password (user)
opw    - Set operator password (oper)
admpw  - Set administrator password (admin)
cur    - Display current user statistics
```

This menu allows you to set passwords and display current user statistics. Passwords can be a maximum of 15 characters. To disable a user, set the password to null by simply pressing the **Enter** key when prompted for the password.

The following table describes the **User Access Control Configuration Menu** options.

Table 6-7: User Access Control Configuration Menu Options

Command	Description
usrpw	Sets the user (user) password. The user has no direct responsibility for GbE2 Interconnect Switch management. The user can view GbE2 Interconnect Switch status information and statistics, but cannot make any configuration changes.
opw	Sets the operator (oper) password. The operator manages all functions of the GbE2 Interconnect Switch. The operator can view all GbE2 Interconnect Switch information and statistics and can reset ports. The operator account is disabled by default.
admpw	Sets the administrator (admin) password. The super user administrator has complete access to all menus, information, and configuration commands on the GbE2 Interconnect Switch, including the ability to change both the user and administrator passwords.
cur	Displays the current user status.

Port Configuration

Command: `/cfg/port <port number>`

```
[Port 1 Menu]
gig      - Gig Phy Menu
pvid     - Set default port VLAN id
name     - Set port name
tag      - Enable/disable VLAN tagging for port
iponly   - Enable/disable allowing only IP related frames
ena      - Enable port
dis      - Disable port
cur      - Display current port configuration
```

This menu enables you to configure settings for individual GbE2 Interconnect Switch ports. This command is enabled by default.

The following table describes the **Port Configuration Menu** options.

Table 6-8: Port Configuration Menu Options

Command	Description
gig	This option displays the Gigabit Ethernet Physical Link Menu .
pvid <VLAN number, 1-4094>	Sets the default VLAN number which will be used to forward frames which are not VLAN tagged. The default number is 1.
name <64 character string> none	Sets a name for the port. The assigned port name displays next to the port number on some information and statistics screens. The default is set to none.
tag disable enable	Disables or enables VLAN tagging for this port. It is disabled by default.
iponly disable enable	Disables or enables allowing only IP-related frames. It is disabled by default.
ena	Enables the port.
dis	Disables the port. To temporarily disable a port without changing its configuration attributes, refer to the “Temporarily Disabling a Port” section, later in this chapter.
cur	Displays current port parameters.

Port Link Configuration

Command: **/cfg/port <port number>/gig**

[Gigabit Link Menu]	
speed	- Set link speed
mode	- Set full or half duplex mode
fctl	- Set flow control
auto	- Set auto negotiation
cur	- Display current gig link configuration

Use these menu options to set port parameters for the port link.

Link menu options are described in the following table and display on the Gigabit port configuration menus for the GbE2 Interconnect Switch. Using these configuration menus, you can set port parameters such as speed, duplex, flow control, and negotiation mode for the port link.

The following table describes the **Gigabit Link Configuration Menu** options.

Table 6-9: Gigabit Link Configuration Menu Options

Command	Description
speed 10 100 1000 any	Sets the link speed. Not all options are valid on all ports. The choices include: <ul style="list-style-type: none"> • 10 Mb/s • 100 Mb/s • 1000 Mb/s • "Any," for automatic detection (default)
mode full half any	Sets the operating mode. The choices include: <ul style="list-style-type: none"> • Full-duplex • Half-duplex • "Any," for automatic detection (default)
fctl rx tx both none	Sets the flow control. The choices include: <ul style="list-style-type: none"> • Receive (rx) flow control • Transmit (tx) flow control • Both receive and transmit flow control (default) • No flow control
auto on off	Enables or disables auto-negotiation for the port.
cur	Displays current port parameters.

Temporarily Disabling a Port

To temporarily disable a port without changing its stored configuration attributes, enter the following command at any prompt:

```
Main# /oper/port <port number>/dis
```

Because this configuration sets a temporary state for the port, you do not need to use **apply** or **save**. The port state will revert to its original configuration when the GbE Interconnect Switch is reset. Refer to the “Operations Menu” section in Chapter 7, for other operations-level commands.

IP Configuration

Command: **/cfg/ip**

```
[IP Menu]
  if      - Interface Menu
  gw      - Default Gateway Menu
  dns     - Domain Name System Menu
  rearp   - Set re-ARP period in minutes
  cur     - Display current IP configuration
```

The following table describes the **IP Configuration Menu** options.

Table 6-10: IP Configuration Menu Options

Command	Description
if <interface number>	Displays the IP Interface Menu .
gw <default gateway number>	Displays the IP Default Gateway Menu .
dns	Displays the IP Domain Name System Menu .
rearp <2-120 minutes>	Sets the re-ARP period in minutes. The GbE2 Interconnect Switch periodically sends ARP (Address Resolution Protocol) requests to refresh its address database. This command is used for setting the interval between ARP refreshes of the next IP address in the database. The default interval is 10 minutes.
cur	Displays the current IP configuration.

IP Interface Configuration

Command: `/cfg/ip/if <interface number>`

```
[IP Interface 1 Menu]
  addr    - Set IP address
  mask    - Set subnet mask
  broad   - Set broadcast address
  vlan    - Set VLAN number
  ena     - Enable interface
  dis     - Disable interface
  del     - Delete interface
  cur     - Display current interface configuration
```

The GbE2 Interconnect Switch can be configured with up to 256 IP interfaces. Each IP interface represents the GbE2 Interconnect Switch on an IP subnet on your network. The IP Interface option is disabled by default.

The following table describes the **IP Interface Configuration Menu** options.

Table 6-11: IP Interface Configuration Menu Options

Command	Description
<code>addr <IP address (such as 192.4.17.101)></code>	Configures the IP address of the GbE2 Interconnect Switch interface using dotted decimal notation.
<code>mask <IP subnet mask (such as 255.255.255.0)></code>	Configures the IP subnet address mask for the interface using dotted decimal notation.
<code>broad <broadcast address (such as 192.4.17.255)></code>	Configures the IP broadcast address for the interface using dotted decimal notation.
<code>vlan <VLAN number></code>	Configures the VLAN number for this interface. Each interface can belong to one VLAN, though any VLAN can have multiple IP interfaces in it.
<code>ena</code>	Enables this IP interface.
<code>dis</code>	Disables this IP interface.
<code>del</code>	Removes this IP interface.
<code>cur</code>	Displays the current interface settings.

NOTE: If you enter an IP address, you will be prompted to change the BOOTP setting.

Default IP Gateway Configuration

Command: `/cfg/ip/gw <gateway number>`

```
[Default gateway 1 Menu]
addr      - Set IP address
intr      - Set interval between ping attempts
retry     - Set number of failed attempts to declare gateway DOWN
arp       - Enable/disable ARP only health checks
ena       - Enable default gateway
dis       - Disable default gateway
del       - Delete default gateway
cur       - Display current default gateway configuration
```

The GbE2 Interconnect Switch supports two gateways. By default, no gateways are configured on the switch. Type **1** or **2** in the command as the *<gateway number>*, depending upon which gateway you want to configure.

The following table describes the **Default IP Gateway Configuration Menu** options.

Table 6-12: Default IP Gateway Configuration Menu Options

Command	Description
<code>addr <default gateway address (such as, 192.4.17.44)></code>	Configures the IP address of the default IP gateway using dotted decimal notation.
<code>intr <0-60 seconds></code>	The GbE2 Interconnect Switch pings the default gateway to verify that it is up. The intr option sets the time between health checks. The range is from 1 to 120 seconds. The default is 2 seconds.
<code>retry <number of attempts></code>	Sets the number of failed health check attempts required before declaring this default gateway inoperative. The range is from 1 to 120 attempts. The default is 8 attempts.
<code>arp disable enable</code>	Enables or disables Address Resolution Protocol (ARP) health checks. This command is disabled by default.
<code>ena</code>	Enables the gateway for use.
<code>dis</code>	Disables the gateway.
<code>del</code>	Deletes the gateway from the configuration.
<code>cur</code>	Displays the current gateway settings.

Domain Name System Configuration

Command: `/cfg/ip/dns`

```
[Domain Name System Menu]
prima    - Set IP address of primary DNS server
secon    - Set IP address of secondary DNS server
dname    - Set default domain name
cur      - Display current DNS configuration
```

The **Domain Name System (DNS) Configuration Menu** is used for defining the primary and secondary DNS servers on your local network, and for setting the default domain name served by the GbE2 Interconnect Switch services. DNS parameters must be configured prior to using hostname parameters with the **ping**, **telnet**, **tracert**, and **ftp** commands.

The following table describes the **Domain Name System (DNS) Configuration Menu** options.

Table 6-13: Domain Name System (DNS) Configuration Menu Options

Command	Description
prima <i><IP address (such as 192.4.17.101)></i>	You will be prompted to set the IP address for your primary DNS server. Use dotted decimal notation.
secon <i><IP address (such as 192.4.17.101)></i>	You will be prompted to set the IP address for your secondary DNS server. If the primary DNS server fails, the configured secondary will be used instead. Enter the IP address using dotted decimal notation.
dname <i><dotted DNS notation> none</i>	Sets the default domain name used by the GbE2 Interconnect Switch. For example: <code>mycompany.com</code>
cur	Displays the current Domain Name System (DNS) settings.

VLAN Configuration

Command: `/cfg/vlan <VLAN number>`

```
[VLAN 1 Menu]
name      - Set VLAN name
stg       - Assign VLAN to a Spanning Tree Group
add       - Add port to VLAN
rem       - Remove port from VLAN
def       - Define VLAN as list of ports
ena       - Enable VLAN
dis       - Disable VLAN
del       - Delete VLAN
cur       - Display current VLAN configuration
```

The commands in this menu configure VLAN attributes, change the status of the VLAN, delete the VLAN, and change the port membership of the VLAN. For more information on configuring VLANs, refer to the “Setup Part 3: VLANs” section in Chapter 3.

By default, the VLAN menu option is disabled except VLAN 1, which is always enabled. The GbE2 Interconnect Switch supports a maximum of 255 VLANs.

NOTE: Refer to the *HP ProLiant BL p-Class GbE2 Interconnect Switch Application Guide* for information on VLANs.

The following table describes the **VLAN Configuration Menu** options.

Table 6-14: VLAN Configuration Menu Options

Command	Description
name	Assigns a name to the VLAN or changes the existing name. The default VLAN name is the first one.
stg <spanning tree group index>	Assigns a VLAN to a spanning tree group.
add <port number>	Adds ports or trunk groups to the VLAN membership.
rem <port number>	Removes ports or trunk groups from this VLAN.
def <list of port numbers>	Defines which ports are members of this VLAN. Every port must be a member of at least one VLAN. By default, it defines ports to VLAN 1.
ena	Enables this VLAN.
dis	Disables this VLAN without removing it from the configuration.
del	Deletes this VLAN.
cur	Displays the current VLAN configuration.

IMPORTANT: All ports must belong to at least one VLAN. Any port which is removed from a VLAN and which is not a member of any other VLAN is automatically added to default VLAN #1. You cannot remove a port from VLAN #1 if the port has no membership in any other VLAN. Also, you cannot add a port to more than one VLAN unless the port has VLAN tagging turned on. Refer to the **tag** command, in the “Port Configuration” section, earlier in this chapter.

Spanning Tree Configuration

Command: **/cfg/stp**

```
[Spanning Tree Group 1 Menu]
  brg      - Bridge parameter menu
  port     - Port parameter menu
  add      - Add VLAN(s) to Spanning Tree Group
  remove   - Remove VLAN(s) from Spanning Tree Group
  clear    - Remove all VLANs from Spanning Tree Group
  on       - Globally turn Spanning Tree ON
  off      - Globally turn Spanning Tree OFF
  default  - Default Spanning Tree and Member parameters
  cur      - Display current bridge parameters
```

The GbE2 Interconnect Switch supports IEEE 802.1D Spanning Tree Protocol (STP) and is compatible with Cisco® PVST+ and Cisco PVST, when the other device is configured as untagged or configured to use 802.1q tagging. STP is used to prevent loops in the network topology. There are 16 spanning tree groups that can be configured on the GbE2 Interconnect Switch. This command is turned on by default.

NOTE: Refer to the *HP ProLiant BL p-Class GbE2 Interconnect Switch Application Guide* for information on Spanning Tree Protocol.

The following table describes the **Spanning Tree Group Configuration Menu** options.

Table 6-15: Spanning Tree Configuration (STP) Menu Options

Command	Description
brg	Displays the Bridge Spanning Tree Menu .
port <port number>	Displays the Spanning Tree Port Menu .
add <VLAN number>	Associates a VLAN with a spanning tree and requires an external VLAN ID as a parameter.
remove <VLAN number>	Breaks the association between a VLAN and a spanning tree and requires an external VLAN ID as a parameter.
clear	Removes all VLANs from a spanning tree.
on	Globally enables Spanning Tree Protocol. This is the default.

continued

Table 6-15: Spanning Tree Configuration (STP) Menu Options *continued*

Command	Description
off	Globally disables Spanning Tree Protocol.
default	Restores a spanning tree instance to its default configuration.
cur	Displays current Spanning Tree Protocol parameters.

Bridge Spanning Tree Configuration

Command: **/cfg/stp/brg**

```
[Bridge Spanning Tree Menu]
prior - Set bridge Priority [0-65535]
hello - Set bridge Hello Time [1-10 secs]
mxage - Set bridge Max Age (6-40 secs)
fwd   - Set bridge Forward Delay (4-30 secs)
aging - Set bridge Aging Time (1-65535 secs, 0 to disable)
cur    - Display current bridge parameters
```

Spanning tree bridge parameters affect the global STP operation of the GbE2 Interconnect Switch. STP bridge parameters include:

- Bridge priority
- Bridge hello time
- Bridge maximum age
- Forwarding delay
- Bridge aging time

The following table describes the **Bridge Spanning Tree Configuration Menu** options.

Table 6-16: Bridge Spanning Tree Configuration Menu Options

Command	Description
<code>prior <new bridge priority></code>	<p>Configures the bridge priority. The bridge priority parameter controls which bridge on the network is the STP root bridge.</p> <p>To make this GbE2 Interconnect Switch the root bridge, configure the bridge priority lower than all other GbE2 Interconnect Switches and bridges on your network. The lower the value, the higher the bridge priority. The range is 0 to 65535, and the default is 32768.</p>
<code>hello <new bridge hello time></code>	<p>Configures the bridge hello time. The hello time specifies how often the root bridge transmits a configuration bridge protocol data unit (BPDU).</p> <p>Any bridge that is not the root bridge uses the root bridge hello value. The range is 1 to 10 seconds, and the default is 2 seconds.</p>
<code>mxage <new bridge max age></code>	<p>Configures the bridge maximum age. The maximum age parameter specifies the maximum time the bridge waits without receiving a configuration bridge protocol data unit before it reconfigures the STP network. The range is 6 to 40 seconds, and the default is 20 seconds.</p>
<code>fwd <new bridge Forward Delay></code>	<p>Configures the bridge forward delay parameter. The forward delay parameter specifies the amount of time that a bridge port has to wait before it changes from the listening state to the learning state and from the learning state to the forwarding state. The range is 4 to 30 seconds, and the default is 15 seconds.</p>
<code>aging <new bridge Aging Time></code>	<p>Configures the Forwarding Database aging time. The aging time specifies the amount of time the bridge waits without receiving a packet from a station before removing the station from the forwarding database. The range is 1 to 65535 seconds, and the default is 300 seconds. To disable aging, set this parameter to zero (0).</p>
<code>current</code>	Displays the current bridge STP parameters.

When configuring STP bridge parameters, the following formulas must be used:

- $2*(fwd-1) \geq mxage$
- $2*(hello+1) \leq mxage$

Spanning Tree Port Configuration

Command: `/cfg/stp <STP Group Index> / port <port number>`

```
[Spanning Tree Port 1 Menu]
prior - Set port Priority (0-255)
cost  - Set port Path Cost (1-65535, 0 for default)
on     - Turn port's Spanning Tree ON
off    - Turn port's Spanning Tree OFF
cur    - Display current port Spanning Tree parameters
```

Spanning tree port parameters are used to modify STP operation on an individual port basis. STP port parameters include:

- Port priority
- Port path cost

The **port** option of STP is turned on by default.

The following table describes the **Spanning Tree Port Configuration Menu** options.

Table 6-17: Spanning Tree Port Configuration Menu Options

Command	Description
prior	Configures the port priority. The port priority helps determine which bridge port becomes the designated port. In a network topology that has multiple bridge ports connected to a single segment, the port with the lowest port priority becomes the designated port for the segment. The range is 0 to 255, and the default is 128.
cost <new port Path Cost>	Configures the port path cost. The port path cost is used to help determine the designated port for a segment. Generally speaking, the faster the port, the lower the path cost. The range is 1 to 65535. The default is 10 for 100Mb/s ports, and 1 for Gigabit ports. A value of zero (0) indicates that the default cost will be computed for an auto-negotiated link speed.
on	Enables STP on the port.
off	Disables STP on the port.
cur	Displays the current STP port parameters.

SNMP Configuration

Command: `/cfg/snmp`

```
[SNMP Menu]
name      - Set SNMP "sysName"
locn      - Set SNMP "sysLocation"
cont      - Set SNMP "sysContact"
rcomm     - Set SNMP read community string
wcomm     - Set SNMP write community string
trap1     - Set first SNMP trap host address
trap2     - Set second SNMP trap host address
tlcomm    - Set community string for first trap host
t2comm    - Set community string for second trap host
auth      - Enable or disable SNMP "sysAuthenTrap"
linkt     - Enable or disable SNMP link up/down trap
cur       - Display current SNMP configuration
```

The GbE Interconnect Switch software supports SNMP-based network management. If you are running an SNMP network management station on your network, you can manage the GbE2 Interconnect Switch using SNMP MIBs. Refer to the *HP ProLiant BL p-Class GbE2 Interconnect Switch User Guide* for a list of SNMP MIBs.

The following table describes the **SNMP Configuration Menu** options.

Table 6-18: SNMP Configuration Menu Options

Command	Description
<code>name <new string, maximum 64 characters></code>	Configures the name for the system. The name can have a maximum of 64 characters.
<code>locn <new string, maximum 64 characters></code>	Configures the name of the system location. The location can have a maximum of 64 characters.
<code>cont <new string, maximum 64 characters></code>	Configures the name of the system contact. The contact can have a maximum of 64 characters.
<code>rcomm <new SNMP read community string, maximum 32 characters></code>	Configures the SNMP read community string. The read community string controls SNMP “get” access to the GbE2 Interconnect Switch. It can have a maximum of 32 characters. The default read community string is public.
<code>wcomm <new SNMP write community string, maximum 32 characters></code>	Configures the SNMP write community string. The write community string controls SNMP “set” and “get” access to the GbE2 Interconnect Switch. It can have a maximum of 32 characters. The default write community string is private.
<code>trap1 <new SNMP trap host IP address (such as, 192.4.17.101)></code>	Configures the IP address of the first SNMP trap host using dotted decimal notation. The SNMP trap host is the device that receives SNMP trap messages from the GbE2 Interconnect Switch.

continued

Table 6-18: SNMP Configuration Menu Options *continued*

Command	Description
<code>trap2 <new SNMP trap host IP address (such as, 192.4.17.101)></code>	Configures the IP address of the second SNMP trap host using dotted decimal notation.
<code>t1comm <new trap host community string, maximum 32 characters></code>	Configures the community string for the first trap host. The default community string for the first trap host is public.
<code>t2comm <new trap host community string, maximum 32 characters></code>	Configures the community string for the second trap host. The default community string for the second trap host is public.
<code>auth disable enable</code>	Enables or disables the use of the system authentication trap facility. The default setting is disable.
<code>linkt <port> [disable enable]</code>	Enables or disables the sending of SNMP link up and link down traps. The default setting is enable.
<code>cur</code>	Displays the current STP port parameters.

Port Mirroring

Command: `/cfg/pmirr`

```
[Port Mirroring Menu]
  mirror - Enable/Disable Mirroring
  monport - Monitoring Port based PM Menu
  cur      - Display All Mirrored and Monitoring Ports
```

The **Port Mirroring Configuration Menu** is used to configure, enable, and disable the monitored port. When enabled, network packets being sent and/or received on a target port are duplicated and sent to a monitor port. By attaching a network analyzer to the monitor port, you can collect detailed information about your network performance and usage. Port mirroring is disabled by default.

NOTE: Refer to Appendix A, “Troubleshooting Tools,” in the *HP ProLiant BL p-Class GbE2 Interconnect Switch Application Guide* for information on how to use port mirroring.

The following table describes the **Port Mirroring Configuration Menu** options.

Table 6-19: Port Mirroring Configuration Menu Options

Command	Description
<code>mirror disable enable</code>	Enables or disables port mirroring
<code>monport <port number></code>	Displays port mirroring menu.
<code>cur</code>	Displays current settings of the mirrored and monitoring ports.

Port-Based Port Mirroring

Command: `/cfg/pmirr/monport <port number>`

[Port 1 Menu]	
add	- Add "Mirrored" port
rem	- Rem "Mirrored" port
delete	- Delete this "Monitor" port
cur	- Display current Port-based Port Mirroring configuration

The following table describes the port-based **Port Mirroring Configuration Menu** options.

Table 6-20: Port Mirroring Configuration Menu

Command	Description
<code>add <mirrored port (port to mirror from)> <direction (in, out, or both)></code>	<p>Adds the port to be mirrored. This command also allows you to enter the direction of the traffic. It is necessary to specify the direction because:</p> <ul style="list-style-type: none"> • If the source port of the frame matches the mirrored port and the mirrored direction is ingress or both (ingress and egress), the frame is sent to the mirrored port. • If the destination port of the frame matches the mirrored port and the mirrored direction is egress or both, the frame is sent to the monitoring port.
<code>rem <mirrored port (port to mirror from)></code>	Removes the mirrored port.
<code>delete</code>	Delete this monitored port.
<code>cur</code>	Displays the current settings of the monitoring port.

Trunk Configuration

Command: `/cfg/trunk <trunk group number>`

```
[Trunk group 1 Menu]
add      - Add port to trunk group
rem      - Remove port from trunk group
ena      - Enable trunk group
dis      - Disable trunk group
del      - Delete trunk group
cur      - Display current Trunk Group configuration
```

Trunk groups can provide super-bandwidth connections between GbE2 Interconnect Switches or other trunk capable devices. A trunk is a group of ports that act together, combining their bandwidth to create a single, larger port. Up to 12 trunk groups can be configured on the GbE Interconnect Switch, with the following restrictions.

- Any physical GbE2 Interconnect Switch port can belong to no more than one trunk group.
- Up to six ports/trunks can belong to the same trunk group.
- Best performance is achieved when all ports in a trunk are configured for the same speed.
- Trunking from other devices must comply with Cisco® EtherChannel® technology.
- By default, port 17 and port 18 are trunked to support an internal switch to switch crosslink trunk.

NOTE: Refer to the *HP ProLiant BL p-Class GbE2 Interconnect Switch Application Guide* for information on how to use port trunks.

The following table describes the **Trunk Group Configuration Menu** options.

Table 6-21: Trunk Group Configuration Menu Options

Command	Description
<code>add <port number></code>	Adds a physical port to the current trunk group.
<code>rem <port number></code>	Removes a physical port from the current trunk group.
<code>ena</code>	Enables the current trunk group.
<code>dis</code>	Turns the current trunk group off.
<code>del</code>	Removes the current trunk group configuration.
<code>cur</code>	Displays current trunk group parameters.

Setup

Command: **/cfg/setup**

The Setup utility steps you through configuring the system date and time, BOOTP, IP, spanning tree, port speed/mode, VLAN parameters, and IP interfaces.

To start the Setup utility, at the **Configuration#** prompt, enter:

```
Configuration# setup
```

For a complete description of how to use Setup, refer to Chapter 3, “First-Time Configuration.”

NOTE: The Setup utility is available through the command line interface only.

Dump

Command: **/cfg/dump**

The dump program writes the current GbE2 Interconnect Switch configuration to the terminal screen. To start the dump program, at the **Configuration#** prompt, enter:

```
Configuration# dump
```

The configuration is displayed with parameters that have been changed from the default values. The screen display can be captured, edited, and placed in a script file, which can be used to configure other GbE2 Interconnect Switches. Paste the configuration commands from the script file at the command line prompt of the GbE2 Interconnect Switch. The active configuration can also be saved or loaded via TFTP.

Saving the Active GbE2 Interconnect Switch Configuration

Command: **/cfg/ptcfg <TFTP server> <filename>**

When the **ptcfg** command is used, the active configuration commands of the GbE2 Interconnect Switch (as displayed using **/cfg/dump**) will be uploaded to the specified script configuration file on the TFTP server. To start the GbE2 Interconnect Switch configuration upload, at the **Configuration#** prompt, enter:

```
Configuration# ptcfg <TFTP server> <filename>
```

Where **<TFTP server>** is the TFTP server IP address or hostname, and **<filename>** is the name of the target script configuration file.

NOTE: The output file is formatted with line-breaks but no carriage returns. The file cannot be viewed with editors that require carriage returns (such as Microsoft Notepad).

NOTE: If the TFTP server is running SunOS™ or the Solaris™ operating system, the specified **ptcfg** file must exist prior to executing the **ptcfg** command and must be writable (set with proper permission, and not locked by any application). The contents of the specified file will be replaced with the current configuration data.

Restoring the Active GbE2 Interconnect Switch Configuration

Command: `/cfg/gtcfg <TFTP server> <filename>`

When the **gtcfg** command is used, the active configuration will be replaced with the commands found in the specified configuration file. The file can contain a full GbE2 Interconnect Switch configuration or a partial configuration. The configuration loaded using **gtcfg** is not activated until the **apply** command is used. If the **apply** command is found in the configuration script file loaded using this command, the **apply** action will be performed automatically.

To start the GbE2 Interconnect Switch configuration download, at the **Configuration#** prompt, enter:

```
Configuration# gtcfg <TFTP server> <filename>
```

Where **<TFTP server>** is the TFTP server IP address or hostname, and **<filename>** is the name of the target script configuration file.

NOTE: The GbE2 Interconnect Switch supports three configuration files: active, backup, and factory. Refer to the “Selecting a Configuration Block” section in Chapter 8, The Boot Options Menu, for information on how to set which configuration file to use upon bootup.

The Operations Menu

Introduction

Operations-level commands are used for making immediate and temporary changes to GbE2 Interconnect Switch configuration. The **Operations Menu** is used for bringing ports temporarily in and out of service. This menu is available only from an administrator and operator login.

Operations Menu

Command: **/oper**

[Operations Menu] port - Operational Port Menu

The following table describes the **Operations Menu** options.

Table 7-1: Operations Menu Options

Command	Description
port <port as number>	Displays the Operations-Level Port Menu .

Operations-Level Port Options

Command: */oper/port <port number>*

[Operations Port 1 Menu]	
ena	- Enable port
dis	- Disable port
cur	- Current port state

Operations-level port options are used for temporarily disabling or enabling a port.

Table 7-2: Operations-Level Port Menu Options

Command	Description
ena	Temporarily enables the port. The port will be returned to its configured operation mode when the GbE2 Interconnect Switch is reset.
dis	Temporarily disables the port. The port will be returned to its configured operation mode when the GbE2 Interconnect Switch is reset.
cur	Displays the current settings for the port.

The Boot Options Menu

Introduction

You must be logged in to the GbE2 Interconnect Switch as the administrator to use the **Boot Options Menu**.

The **Boot Options Menu** provides options for:

- Selecting a switch software image to be used when the GbE2 Interconnect Switch is next reset.
- Selecting a configuration block to be used when the GbE2 Interconnect Switch is next reset.
- Downloading or uploading a new software image to the GbE2 Interconnect Switch via TFTP.

Boot Menu

Command: **/boot**

```
[Boot Options Menu]
image - Select software image to use on next boot
conf  - Select config block to use on next boot
gting - Download new software image via TFTP
ptimg - Upload selected software image via TFTP
reset - Reset switch [WARNING: Restarts Spanning Tree]
cur   - Display current boot options
```

Each of the **Boot Options Menu** commands is discussed in greater detail in the following sections.

Updating the GbE2 Interconnect Switch Software Image

The GbE2 Interconnect Switch software image is the executable code running on the switch. A version of the image ships with the GbE2 Interconnect Switch, and comes pre-installed on the device. As new versions of the image are released, you can upgrade the software running on your GbE2 Interconnect Switch.

Upgrading the software image on your GbE2 Interconnect Switch requires the following:

- Loading the new image onto a TFTP server on your network
- Downloading the new image from the TFTP server to your GbE2 Interconnect Switch
- Selecting the new software image to be loaded into GbE2 Interconnect Switch memory the next time the switch is reset

Downloading New Software to Your GbE2 Interconnect Switch

The GbE2 Interconnect Switch can store up to two different software images, called **image1** and **image2**, as well as boot software, called **boot**. When you download new software, you must specify where it should be placed: either into **image1**, **image2**, or **boot**.

For example, if your active image is currently loaded into **image1**, you would probably load the new image software into **image2**. This lets you test the new software and reload the original active image (stored in **image1**), if needed.

To download a new software to your GbE2 Interconnect Switch, you will need the following:

- The image or boot software loaded on a TFTP server on your network
- The hostname or IP address of the TFTP server
- The name of the new software image or boot file

NOTE: The DNS parameters must be configured if specifying hostnames. Refer to the “Domain Name System Configuration” section in Chapter 6.

When the above requirements are met, use the following procedure to download the new software to your GbE2 Interconnect Switch.

1. At the **Boot Options#** prompt, enter:

```
Boot Options# gtimg
```

2. Enter the name of the GbE2 Interconnect Switch software to be replaced:

```
Enter name of switch software image to be replaced  
["image1"/"image2"/"boot"]: <image>
```

3. Enter the hostname or IP address of the TFTP server:

```
Enter hostname or IP address of TFTP server: <server name or IP  
address>
```

4. Enter the name of the new software file on the server:

```
Enter name of file on TFTP server: <filename>
```

The exact form of the name will vary by TFTP server. However, the file location is normally relative to the TFTP directory.

5. The system prompts you to confirm your request.

You should next select a software image to run, as described in the “Selecting a Soft Image to Run” section.

6. If you are loading an image from which you are not currently booted, the system prompts you to change the image.

```
image2 currently contains Software Version 1.0.0.7
that was downloaded at 15:46:36 Wed Apr 23, 2003.
New download will replace image2 with file "1.0.0.8_OS.img"
from TFTP server 192.168.2.4.
Confirm download operation [y/n]: y
Invoking TFTP over port 69...
Starting download...
File appears valid
Download in
progress.....
Image download complete (1333953 bytes)
Writing to flash...This takes about 90 seconds. Please wait
Write complete (1333953 bytes), now verifying FLASH...
Verification of new image2 in FLASH successful.
image2 now contains Software Version 1.0.0.8
Switch is currently set to boot software image1.
Do you want to change that to the new image2? [y/n] y
Next boot will use new software image2.
```

Selecting a Software Image to Run

You can select which software image (**image1** or **image2**) you want to run in GbE2 Interconnect Switch memory for the next reboot.

1. At the **Boot Options#** prompt, enter:

```
Boot Options# image
```

2. Enter the name of the image you want the GbE2 Interconnect Switch to use upon the next boot. The system informs you of which image is currently set to be loaded at the next reset, and prompts you to enter a new choice:

```
Currently set to use switch software "image1" on next reset.
Specify new image to use on next reset ["image1"/"image2"]:
```

Uploading a Software Image from Your GbE2 Interconnect Switch

You can upload a software image from the GbE2 Interconnect Switch to a TFTP server.

1. At the **Boot Options#** prompt, enter:

```
Boot Options# ptimg
```

2. The system prompts you for information. Enter the desired image:

```
Enter name of switch software image to be uploaded  
["image1"|"image2"|"boot"]: <image> <hostname or server-IP-addr>  
<server-filename>
```

3. Enter the name or the IP address of the TFTP server:

```
Enter hostname or IP address of TFTP server: <server name or IP  
address>
```

4. Enter the name of the file into which the image will be uploaded on the TFTP server:

```
Enter name of file on TFTP server: <filename>
```

5. The system then requests confirmation of what you have entered. To have the file uploaded, enter **y**.

```
image2 currently contains Software Version 1.0.1.0  
Upload will transfer image2 (1889411 bytes) to file "test"  
on TFTP server 192.1.1.1.  
Confirm upload operation [y/n]: y
```


Selecting a Configuration Block

When you make configuration changes to the GbE2 Interconnect Switch, you must save the changes so that they are retained beyond the next time the switch is reset. When you execute the **save** command, your new configuration changes are placed in the active configuration block. The previous configuration is copied into the backup configuration block.

There is also a factory configuration block. This holds the default configuration set by the factory when your GbE2 Interconnect Switch was manufactured. Under certain circumstances, it may be desirable to reset the GbE2 Interconnect Switch configuration to the default. This can be useful when a custom-configured GbE2 Interconnect Switch is moved to a network environment where it will be re-configured for a different purpose.

Use the following procedure to set which configuration block you want the GbE2 Interconnect Switch to load the next time it is reset:

1. At the **Boot Options#** prompt, enter:

```
Boot Options# conf
```

2. Enter the name of the configuration block you want the GbE2 Interconnect Switch to use.

The system indicates which configuration block is currently set to be loaded at the next reset, and prompts you to enter a new choice:

```
Currently set to use active configuration block on next reset.  
Specify new block to use ["active"/"backup"/"factory"]:
```

Resetting the GbE2 Interconnect Switch

You can reset the GbE2 Interconnect Switch to make your software image file and configuration block changes occur.

Resetting the GbE2 Interconnect Switch causes the Spanning Tree Protocol to restart. This process can be lengthy, depending on the topology of your network.

To reset the GbE2 Interconnect Switch, at the **Boot Options#** prompt, enter:

```
>> Boot Options# reset
```

You are prompted to confirm your request.

To display current boot options, enter:

```
>> Boot Options# cur
```

The Maintenance Menu

Introduction

The **Maintenance Menu** is used for debugging purposes, enabling you to generate a technical support dump of the critical state information in the GbE2 Interconnect Switch, and to clear entries in the Forwarding Database and the Address Resolution Protocol (ARP) and routing tables. This menu is available only from an administrator and operator login.

Maintenance Menu

Command: **/maint**

```
[Maintenance Menu]
  sys      - System Maintenance Menu
  fdb      - Forwarding Database Manipulation Menu
  debug    - Debugging Menu
  arp      - ARP Cache Manipulation Menu
  uudmp    - Uuencode FLASH dump
  ptdmp    - tftp put FLASH dump to tftp server
  cldmp    - Clear FLASH dump
  panic    - Dump state information to FLASH and reboot
  tsdmp    - Tech support dump
```

To use the **Maintenance Menu**, you must be logged in to the GbE2 Interconnect Switch as the administrator.

Dump information contains internal GbE2 Interconnect Switch state data that is written to flash memory on the switch after any one of the following occurs:

- The GbE2 Interconnect Switch administrator forces a switch panic. The panic option, found in the **Maintenance Menu**, causes the GbE2 Interconnect Switch to dump state information to flash memory, and then causes the switch to reboot.
- The GbE2 Interconnect Switch administrator enters the switch reset key combination (**Ctrl-**) on a device that is attached to the console port.
- The watchdog timer forces a GbE2 Interconnect Switch reset. The purpose of the watchdog timer is to reboot the GbE2 Interconnect Switch if the switch software freezes.
- The GbE2 Interconnect Switch detects a hardware or software problem that requires a reboot.

The following table describes the **Maintenance Menu** options.

Table 9-1: Maintenance Menu Options

Command	Usage
sys	Displays the System Maintenance Menu .
fdb	Displays the Forwarding Database Manipulation Menu .
debug	Displays the Debug Menu .
arp	Displays the ARP Cache Manipulation Menu .
uudmp	Displays dump information in uuencoded format.
ptdmp hostname, filename [-mgmt -data]	Saves the system dump information via TFTP.
cldmp	Clears dump information from flash memory.
panic	Dumps MP information to flash and reboots.
tsdmp	Dumps all GbE2 Interconnect Switch information, statistics, and configuration.

System Maintenance Options

Command: **/maint/sys**

```
[System Maintenance Menu]
      flags    - Set NVRAM flag word
```

The **System Maintenance Menu** is reserved for use by HP technical support. The options are used to perform system debugging.

The following table describes the **System Maintenance Menu** options.

Table 9-2: System Maintenance Menu Options

Command	Usage
flags <new NVRAM flags word as 0xFFFFFFFF>	This command sets the flags that are used for debugging purposes by HP technical support.

Forwarding Database Options

Command: **/maint/fdb**

```
[FDB Manipulation Menu]
find      - Show a single FDB entry by MAC address
port      - Show FDB entries for a single port
vlan      - Show FDB entries for a single VLAN
dump      - Show all FDB entries
del       - Delete an FDB entry
clear     - Clear entire FDB
```

The **Forwarding Database (FDB) Manipulation Menu** can be used to view information and to delete a MAC address from the Forwarding Database or clear the entire Forwarding Database. This is helpful in identifying problems associated with MAC address learning and packet forwarding decisions.

The following table describes the **FDB Manipulation Menu** options.

Table 9-3: FDB Manipulation Menu Options

Command	Usage
find <MAC address> [<VLAN>]	Displays a single database entry by its MAC address. You are prompted to enter the MAC address of the device. Enter the MAC address using one of the following: <ul style="list-style-type: none"> xx:xx:xx:xx:xx:xx format (for example: 08:00:20:12:34:56) xxxxxxxxxxxx format (for example: 080020123456).
port <port number>	Displays all FDB entries for a particular port.
vlan <VLAN number>	Displays all FDB entries on a single VLAN.
dump	Displays all entries in the Forwarding Database.
del <MAC address> [<VLAN>]	Removes a single FDB entry.
clear	Clears the entire Forwarding Database from GbE2 Interconnect Switch memory.

Debugging Options

Command: **/maint/debug**

```
[Miscellaneous Debug Menu]
  tbuf    - Show MP trace buffer
  snap    - Show MP snap (or post-mortem) trace buffer
  clrcfg  - Clear all flash configs
  gea     - GEA 5690 Menu
```

The **Miscellaneous Debug Menu** displays trace buffer information about events that can be helpful in understanding GbE2 Interconnect Switch operation. You can view the following information using the **Debug Menu**:

- Events traced by the management processor (MP)
- Events traced to a buffer area when a reset occurs

If the GbE2 Interconnect Switch resets for any reason, the management processor (MP) trace buffer is saved into the snap trace buffer area. The output from these commands can be interpreted by HP technical support.

The following table describes the **Miscellaneous Debug Menu** options:

Table 9-4: Miscellaneous Debug Menu Options

Command	Usage
tbuf	Displays the management processor trace buffer. Header information similar to the following is shown: MP trace buffer at 13:28:15 Fri May 25, 2002; mask: 0x2ffdf748 The buffer information is displayed after the header.
snap	Displays the management processor snap (or post-mortem) trace buffer. This buffer contains information traced at the time that a reset occurred.
clrcfg	Deletes all flash configuration blocks. The next time the GbE2 Interconnect Switch is rebooted, it returns to the factory default settings.
gea	This menu is reserved for debugging purposes by HP technical support.

ARP Cache Options

Command: **/maint/arp**

```
[Address Resolution Protocol Menu]
  find    - Show a single ARP entry by IP address
  port    - Show ARP entries on a single port
  vlan    - Show ARP entries on a single VLAN
  refpt   - Show ARP entries referenced by a single port
  dump    - Show all ARP entries
  add     - Add a permanent ARP entry
  del     - Delete an ARP entry
  clear   - Clear ARP cache
  addr    - Show ARP address list
```

The following table describes the **Address Resolution Protocol Menu** options:

Table 9-5: Address Resolution Protocol Menu Options

Command	Usage
find <IP address (such as, 192.4.17.101)>	Shows a single ARP entry by IP address.
port <port number>	Shows ARP entries on a single port.
vlan <VLAN number>	Shows ARP entries on a single VLAN.
refpt <port number>	Shows all ARP entries referenced by a single port.
dump	Shows all ARP entries.
add <IP address> <MAC address> <VLAN number> <port>	Adds a single ARP entry to GbE2 Interconnect Switch memory.
del <IP address (such as, 192.4.17.101)>	Removes a single ARP entry from GbE2 Interconnect Switch memory.
clear	Clears the entire ARP list from GbE2 Interconnect Switch memory.
addr	Shows the list of IP addresses which the GbE2 Interconnect Switch will respond to for ARP requests.

NOTE: To display all ARP entries currently held in the GbE2 Interconnect Switch, or a portion according to one of the options listed on the menu above (**find**, **port**, **vlan**, **refpt**, **dump**), refer to the “ARP Information” section in Chapter 4.

Uuencode Flash Dump

Command: **/maint/uudmp**

Using this command, dump information is presented in uuencoded format. This format makes it easy to capture the dump information as a file or a string of characters.

If you want to capture dump information to a file, set your communication software on your workstation to capture session data prior to issuing the **uudmp** command. This will ensure that you do not lose any information. Once entered, the **uudmp** command will cause approximately 23,300 lines of data to be displayed on your screen and copied into the file.

Using the **uudmp** command, dump information can be read multiple times. The command does not cause the information to be updated or cleared from flash memory.

Dump information is not cleared automatically. In order for any subsequent dump information to be written to flash memory, you must manually clear the dump region. For more information on clearing the dump region, refer to the “Clearing Dump Information” section later in this chapter.

To access dump information, at the **Maintenance#** prompt, enter:

```
Maintenance# uudmp
```

The dump information is displayed on your screen and, if you have configured your communication software to do so, captured to a file. If the dump region is empty, the following displays:

```
No FLASH dump available.
```

TFTP System Dump Put

Command: **/maint/ptdmp <server> <filename>**

Use this command to save the system dump to a TFTP server.

If the TFTP server is running SunOS or the Solaris operating system, the specified **ptdmp** file must exist prior to executing the **ptdmp** command, and must be writable (set with proper permission, and not locked by any application). The contents of the specified file will be replaced with the current dump data.

To save dump information via TFTP, at the **Maintenance#** prompt, enter:

```
Maintenance# ptdmp <server> <filename>
```

Type the TFTP server IP address or hostname as **<server>**, and the target dump file as **<filename>**.

Clearing Dump Information

Command: **/maint/cldmp**

To clear dump information from flash memory, at the **Maintenance#** prompt, enter:

```
Maintenance# cldmp
```

The GbE2 Interconnect Switch clears the dump region of flash memory and displays the following message:

```
FLASH dump region cleared.
```

If the flash dump region is already clear, the switch displays the following message:

```
FLASH dump region is already clear.
```

Panic Command

Command: **/maint/panic**

The panic command causes the GbE2 Interconnect Switch to immediately dump state information to flash memory and automatically reboot.

To select panic, at the **Maintenance#** prompt, enter:

```
>> Maintenance# panic
A FLASH dump already exists.
Confirm replacing existing dump and reboot [y/n]:
```

Enter **y** to confirm the command:

```
Confirm dump and reboot [y/n]: y
```

A list of messages is displayed:

```
Starting system dump...done.

Reboot at 11:54:08 Wednesday October 30, 2002...

. . . . .

. . . . .

Rebooted because of console PANIC command.

Booting complete
```


Unscheduled System Dumps

If there is an unscheduled system dump to flash memory, the following message is displayed when you log on to the GbE2 Interconnect Switch:

```
Note: A system dump exists in FLASH. The dump was saved
      at 13:43:22 Wednesday October 30, 2002. Use /maint/uudmp to
      extract the dump for analysis and /maint/cldmp to
      clear the FLASH region. The region must be cleared
      before another dump can be saved.
```

A

- abbreviating commands 2-6
- access control, user 6-11
- active configuration block 6-3, 8-5
- active switch configuration
 - gtcfg 6-28
 - ptcfg 6-27
 - restoring 6-28
- Address Resolution Protocol (ARP)
 - add/delete entries 9-5
 - address list 9-5
 - interval 6-14
 - statistics 5-25
- Address Resolution Protocol (ARP) Menu 4-5, 9-5
- administrator account 3-1
- admpw (system option) 6-11
- aging
 - STP bridge option 6-21
 - STP information 4-13
- apply command 2-3, 6-3
- autoconfiguration, link 3-6
- auto-negotiation
 - enable/disable on port 6-13
 - flow control configuration 6-13
 - setup 3-6

B

- backup configuration block 6-3, 8-5
- banner (system option) 6-5
- BLOCKING (port state) 4-13
- Boot Options Menu 8-1
- bootstrap protocol (BOOTP)
 - obtain the IP address 1-3
 - setup 3-5
- bridge maximum age parameter
 - configuration 6-21
 - information 4-13
- bridge parameter menu, for STP 6-19
- bridge priority 4-13
- Bridge Protocol Data Unit (BPDU) 4-13
 - STP transmission frequency 6-21
- bridge Spanning Tree parameters 6-21

- bridging statistics 5-3
- broadcast IP address 3-8

C

- capture dump information to a file 9-6
- clear
 - ARP entries 9-5
 - dump information 9-7
- commands
 - abbreviations 2-6
 - global commands 2-3
 - shortcuts 2-6
 - tab completion 2-6
- component-level repairs vii
- configuration
 - administrator password 6-11
 - apply changes 6-3
 - default gateway interval, for health checks 6-16
 - default gateway IP address 6-16
 - dump command 6-27
 - effect on Spanning Tree Protocol 6-3
 - flow control 6-13
 - Gigabit Ethernet 6-12
 - IP broadcast address 6-15
 - operating mode 6-13
 - port link speed 6-13
 - port mirroring 6-24
 - port trunking 6-26
 - revert changes 6-3
 - save changes 6-3
 - setup 6-27
 - switch IP address 6-15
 - user password 6-11
 - view pending changes 6-2
 - VLAN default (PVID) 6-12
 - VLAN IP interface 6-15
 - VLAN tagging 6-12
- configuration block 8-5
- Configuration Menu 6-1
- connecting
 - via console 1-2
 - via Secure Shell (SSH) 1-4
 - via Telnet 1-3
- console port, connecting 1-2

cost

- STP information 4-13
- STP port option 6-22

CPU statistics 5-14

D

date setup 3-4

daylight savings time 6-10

debugging 9-1

default gateway, interval for health checks 6-16

default password

- administrator 3-11
- operator 3-14
- user 3-13

diff command 2-3, 6-2

diff flash command 2-3, 6-2

DISABLED (port state) 4-13

disconnect idle timeout 1-7

Domain Name System (DNS) Configuration Menu 6-17

Domain Name System (DNS) statistics 5-26

download software 8-2

dump

- configuration 6-27
- information 4-17
- state information 9-7
- statistics 5-26

duplex mode, link status 4-2, 4-11

E

ethernet statistics 5-5

F

factory configuration block 8-5

factory default configuration 3-1, 3-2

first-time configuration 3-1

flow control

- configuration 6-13
- display setting 4-2
- link status 4-11

Forwarding Database (FDB)

- maintenance 9-3
- statistics 5-25

Forwarding Database Information Menu 4-7

Forwarding Database Manipulation Menu 9-3

forwarding state (FWD) 4-8, 4-13, 4-16

fwd (STP bridge option) 6-21

FwdDel (forward delay), bridge port 4-13

G

gig (Port Menu option) 6-12

Gigabit Ethernet Physical Link 6-12

Gigabit Ethernet, configuration 6-12

global commands 2-3

Greenwich Mean Time (GMT) 6-10

grounding vii

grounding plug vii

gtcfg (TFTP load command) 6-28

H

health checks

- default gateway interval, retries 6-16
- retry, number of failed health checks 6-16

hello, STP information 4-13

help resources viii

history command 2-4

HP authorized reseller viii

HTTP, system option 6-6

I

idle timeout, overview 1-7

IEEE standards, 802.1D Spanning Tree Protocol 4-12, 6-19

image

- download 8-2
- software, selection 8-3

information dump 4-17

Information Menu 4-1

interface statistics 5-9, 5-15

Internet Control Messaging Protocol (ICMP) statistics 5-18

IP address

- ARP information 4-5
- BOOTP 1-3
- default gateway configuration 6-16
- IP interface 3-8
- mmask 6-5
- mnet 6-5

IP Configuration Menu 6-14

IP configuration via setup 3-8

IP interface

- address configuration 6-15
- broadcast address (broad) 6-15
- information 4-16
- via setup 3-8
- VLAN configuration 6-15

IP Interface Configuration Menu 6-15

IP routing 3-8

IP statistics 5-17

L

LEARNING (port state) 4-13

lines command 2-3

link speed, configuration 6-13

link statistics 5-11

- link status
 - command 4-11
 - display setting 4-2
 - duplex mode 4-2, 4-11
 - port speed 4-2, 4-11
- linkt (SNMP option) 6-24
- LISTENING (port state) 4-13
- log, syslog messages 6-7
- login notice 6-5
- M**
 - Main Menu 2-1
 - Maintenance Menu 9-1
 - management processor (MP)
 - display MAC address 4-2, 4-9
 - statistics 5-11
 - trace buffer 9-4
 - mask, IP interface subnet address 6-15
 - media access control (MAC) address
 - ARP information 4-5
 - display address 1-3, 4-9
 - FDB information 4-7
 - FDB manipulation 9-3
 - location 4-2
 - Miscellaneous Debug Menu 9-4
 - mmask, system option 6-5
 - mnet, system option 6-5
 - monitor port 6-24
 - MP packet statistics 5-12
 - MP-specific SFD statistics 5-14
- N**
 - Network Time Protocol (NTP)
 - synchronization 6-10
 - time zone 6-10
 - Network Time Protocol (NTP) Server Menu 6-10
 - null modem cable 1-2
- O**
 - online help 2-3
 - operating mode, configuration 6-13
 - Operations Menu 7-1
- P**
 - panic
 - command 9-7
 - switch 9-1
 - passwords, defaults 1-5, 3-11
 - ping command 2-4
 - popd command 2-4
 - port configuration 6-12
 - Port Menu
 - configuration options 6-12, 6-13
 - Gigabit Ethernet (gig) configuration 6-12
 - port mirroring, configuration 6-24
 - port number 4-11
 - port speed 4-2, 4-11
 - port statistics 5-2
 - port trunking configuration 6-26
 - ports
 - disable (temporarily) 6-14
 - information 4-15
 - IP status 4-4
 - membership of the VLAN 4-14
 - priority 4-13
 - STP port priority 6-22
 - priority (STP port option) 6-22
 - prisrv, primary radius server 6-9
 - ptcfg (TFTP save command) 6-27
 - pushd command 2-4
 - pwd command 2-4
- Q**
 - quiet (screen display option) 2-4
- R**
 - RADIUS Server Menu 6-9
 - read community string (SNMP option) 6-23
 - reboot 9-1, 9-7
 - restarting switch setup 3-3
 - retries, radius server 6-9
 - retry, health checks for default gateway 6-16
 - revert apply command 2-3, 6-3
 - revert command 2-3, 6-3
- S**
 - save command 2-3, 6-3, 8-5
 - save n command 2-3
 - secret, radius server 6-9
 - secsrv, secondary radius server 6-9
 - Secure Shell (SSH)
 - encryption and authentication methods 1-4
 - supported clients 1-4
 - Secure Shell Server (SSHD) Menu 6-7
 - Setup utility
 - basic system configuration 3-3
 - bootstrap protocol (BOOTP) 3-5
 - configuration 6-27
 - introduction 3-1
 - IP configuration 3-8
 - port auto-negotiation mode 3-6
 - port configuration 3-5
 - restart 3-3
 - Spanning Tree Protocol 3-5
 - start 3-2

- system date 3-4
- system time 3-4
- VLAN port numbers 3-7
- VLAN tagging 3-6
- VLANs 3-6
- shortcuts 2-6
- Simple Network Management Protocol (SNMP)
 - configuration 6-23
 - optional setup 3-10
 - statistics 5-22
- snap traces, buffer 9-4
- software
 - image 8-2
 - image file and version 4-2, 4-9
- Spanning Tree Group Configuration Menu 6-19
- Spanning Tree Protocol (STP)
 - bridge aging option 6-21
 - bridge parameters 6-21
 - changes to configuration 6-3
 - information 4-12
 - port cost option 6-22
 - port priority option 6-22
 - root bridge 6-21
 - setup 3-5
 - switch reset effect 8-5
 - with trunk groups 4-16
- sshport 6-7
- starting switch setup 3-2
- state (STP information) 4-13
- statistics dump 5-26
- Statistics Menu 5-1
- stopping switch setup 3-3
- subnet address mask configuration, IP subnet
 - address 6-15
- subnets
 - IP interface 6-15
 - setup 3-8
- switch
 - name and location 4-2, 4-9
 - reset 8-5
- syslog
 - clear messages 4-16
 - configuration 6-6
 - display messages 4-10
- system
 - contact (SNMP option) 6-23
 - date and time 4-2, 4-9
 - information 4-9
 - location (SNMP option) 6-23
- System Configuration Menu 6-4
- system options
 - admpw (administrator password) 6-11
 - HTTP access 6-6
 - login banner 6-5
 - mmask 6-5

- mnet 6-5
- tnport 6-5
- usrpw (user password) 6-11
- wport 6-5

T

- tab completion 2-6
- TCP statistics 5-13, 5-20
- technician notes vii
- telephone numbers viii
- Telnet
 - connect to switch 1-3
 - radius server 6-9
 - requirements 1-3
- telnet command 2-4
- time setup 3-4
- timeout, radius server 6-9
- timeouts, idle connection 1-7
- tnport, system option 6-5
- trace buffer 9-4
- traceroute command 2-4
- transmit flow control 6-13
- Trivial File Transfer Protocol (TFTP)
 - PUT and GET commands 6-27
 - use for updating switch software image 8-2
- trunk group information 4-16
- typographical conventions 1-7
- tzone 6-10

U

- UCB statistics 5-13
- UDP statistics 5-21
- unscheduled system dump 9-8
- upgrade, switch software 8-2
- user access control configuration 6-11
- user access levels 1-5
- usrpw (system option) 6-11
- uuencode flash dump 9-6

V

- ventilation clearances vii
- verbose n command 2-4
- view pending configuration changes 6-2
- VLAN tagging
 - port configuration 6-12
 - port restrictions 6-19
 - setup 3-6
- VLANs
 - ARP entry information 4-5
 - configuration 6-18
 - information 4-14
 - interface 3-8
 - name 4-4, 4-14

port membership 4-14
port numbers 3-7
setting default number (PVID) 6-12
setup 3-6, 3-8
tagging 3-6, 4-4, 4-15, 6-19
VLAN number 4-14

W

warranty viii
watchdog timer 9-1
wport 6-5
write community string (SNMP option) 6-23